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1999 Health Care Survey of DoD Beneficiaries:

Adult Technical Manual

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Final

Submitted to:

TRICARE Management Activity
5111 Leesburg Pike, Suite 810
Falls Church, VA 22041
(703) 681-4263

Task Order Officer:
LTC Thomas V. Williams, Ph.D.

Submitted by:

Mathematica Policy Research, Inc.
600 Maryland Ave., SW, Suite 550
Washington, DC 20024-2512
(202) 484-9220

Project Director:
Myles Maxfield, Ph.D.

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Chapter 1

Introduction

The 1999 Adult Health Care Survey of Department of Defense Beneficiaries (HCSDB) is the primary tool with which the TRICARE Management Activity (TMA) of the Assistant Secretary of Defense (Health Affairs) monitors the opinions and experiences of military health system (MHS) beneficiaries. The survey has been conducted annually since 1995. Specifically, the HCSDB is designed to answer the following questions:

- How *satisfied* are DoD beneficiaries with their health care and their health plan?
- How does overall satisfaction with military treatment facilities (MTFs) compare with satisfaction with civilian treatment facilities (CTFs)?
- Does *access* to military and civilian facilities meet TRICARE standards?
- Is beneficiaries' use of preventive health care services in line with national goals, such as those outlined in *Healthy People 2000*?
- What is the general physical and mental health status of MHS beneficiaries?
- Has beneficiaries' use of MHS services changed over time?
- What aspects of MHS care contribute most to beneficiary satisfaction with their health care experiences? With which aspects are beneficiaries least satisfied?
- What are the demographic characteristics of MHS beneficiaries?

The HCSDB is a mail survey of a representative sample of MHS beneficiaries. It is sponsored by the TRICARE Management Activity in the Office of the Assistant Secretary of Defense (Health Affairs) [OASD(HA)] under authority of the National Defense Authorization Act for Fiscal Year 1993 (P.L. 102-484). The DoD Defense Manpower Data Center (DMDC) prepared the sampling frame, which consists of selected variables for each MHS beneficiary in the Defense Enrollment Eligibility Reporting System (DEERS) database in June 1999. DEERS includes everyone who is eligible for a MHS benefit (i.e., everyone in the Uniformed Services--Army, Air Force, Navy, Marine Corps, Coast Guard, the Commissioned Corps of the Public Health Service, National Oceanic and Atmospheric Administration, Guard/Reserve personnel who are activated for more than 30 days -- and other special categories of people who qualify for benefits). DEERS includes those on active duty, those retired from military careers, immediate family members of people in the previous two categories, and surviving family members of people in these categories.

Mathematica Policy Research, Inc. (MPR, Washington, D.C.) prepared the sample of 205,994 adult beneficiaries under subcontract to United Healthcare (Minneapolis) (Jang et al. 1999). Also under subcontract to United Healthcare, Data Recognition Corporation (DRC, Minneapolis) fielded the survey between September 1999 and March 2000. MPR analyzed the survey data, reported on the results, and prepared this document, the "1999 HCSDB Survey of DoD Beneficiaries: Technical Manual" under task order 14, under Contract Number 282-98-0021.

This manual is designed to be used as a reference by analysts in OASD(HA) as they interpret the survey findings and prepare briefings. The manual provides detailed documentation on the following: naming conventions for variables, editing procedures, selection of records, computation

of response rates, recoding of variables, computation of weights, variance estimation, and construction of tables and charts for the reports. The manual enables an analyst to link each cell in each table (or chart) in the reports to the associated question in the Form A questionnaire and/or to the variable in the survey database. The manual also enables an analyst to follow, and replicate if desired, the processing of the raw survey data through each step in the production of the final database.

A. OVERVIEW OF THE HCSDB

This section presents an overview of the methodology used in the survey. From the sample, 84,946 Adult MHS beneficiaries completed and returned a 1999 Adult HCSDB questionnaire between September 1999 and March 2000.

1. Sample Design

The 1999 adult sample design is based on three sample stratifications--enrollment type, beneficiary type, and geographic area. Enrollment type is defined by enrollment in TRICARE Prime with a military primary care manager (PCM), a civilian PCM, or not enrolled. The effect of this stratification is to allocate a greater proportion of the HCSDB sample to those enrolled in Prime and a smaller proportion to those not enrolled in Prime. This shift in the allocation of the sample was prompted by TMA's policy interest in Prime enrollees.

Beneficiary type is defined as active duty, active duty family members under age 65, retirees and family members under age 65 and non-active duty beneficiaries age 65 and over. Compared with previous surveys, this stratification causes a larger proportion of the sample to be allocated to active duty personnel and their family members, and a smaller proportion of the sample to be allocated to retirees. The exception to this general rule is that retirees in the six Medicare Subvention Demonstration sites are oversampled in the 1999 Adult survey to provide data for the evaluation of the demonstration by TMA and the Health Care Financing Administration (HCFA).

The geographic stratification depends on enrollment type. Those enrolled in Prime who have a military PCM typically receive much of their health care from a military treatment facility (MTF), that is a military hospital or clinic. The geographic stratification for such beneficiaries is determined by the MTF that bears the financial responsibility for the beneficiary's health care. This stratification does not depend on the location of the beneficiary's residence, although most such beneficiaries live within the catchment area of the responsible MTF.

Those enrolled in Prime with a civilian PCM typically receive much of their health care from a TRICARE contractor. The geographic stratification for these beneficiaries is the catchment area in which they live.

Those not enrolled in Prime typically receive much of their care through TRICARE Extra/Standard (CHAMPUS) or through a non-MHS health plan. The service area they live in determines the geographic stratification. Conceptually, the service area is the health care market area in which the beneficiary resides. Operationally, the service area is the group of catchment areas in the metropolitan area the beneficiary lives in. For beneficiaries who do not live in a metropolitan area, the service area is the same as the catchment area they live in.

Relative to previous surveys, more military clinics, as opposed to military hospitals, were included in the list of geographic areas. This means that a larger proportion of the 1999 sample is allocated to beneficiaries who receive much of their health care from a military clinic, and a smaller proportion is allocated to those receiving much of their care from a military hospital.

A final key characteristic of the 1999 adult sample design is the oversampling of beneficiaries over the age of 65 in the six sites of the Medicare Subvention Demonstration. The demonstration, sponsored jointly by TMA and the HCFA, is designed to field test a program in which military retirees age 65 and over are enrolled in TRICARE Prime rather than in the Medicare trust fund. The demonstration is now being initiated in 10 MTFs in seven geographic areas in the continental United States.

2. 1999 Adult HCSDB

The HCSDB questionnaire was substantially revised from last year for the 1999 Adult survey. The 1999 Adult questionnaire is reproduced in Appendix A. The major changes were:

- The 1999 adult questionnaire follows the CAHPS questionnaire more closely then the 1998 questionnaire.
- Unlike the 1998 questionnaire, the 1999 adult questionnaire does not contain the traditional DoD satisfaction questions. TMA estimated statistical models relating traditional DoD satisfaction scales to CAHPS satisfaction scales. The models make it easier to track trends between the period of traditional DoD satisfaction scales and the period in which CAHPS questions were adopted.

The adult questionnaire includes the following topics:

- Use of health care
- Use of preventive health care
- Type of health plan covering the beneficiary
- Satisfaction with health plan
- Satisfaction with health care
- Access to health care
- Beneficiaries' health status
- Demographic characteristics

3. Survey Response

The survey was fielded by mail. Out of 205,994 adults sampled, DRC mailed 205,905 questionnaires in Wave 1 between September 28 and October 4, 1999. The final mailing took place on January 17, 2000. Of these questionnaires, 84,946 were completed and returned by March 7, 2000, for a response rate of 41 percent.

4. Database Development

MPR edited the data, selected records for inclusion in the final database, and constructed variables to be used in reports. To ensure that the survey data was representative of the DEERS population, MPR developed weights to take account of the initial sampling, the sampled individuals who chose not to respond to the survey, and post stratification to update the beneficiary's key information.

5. Reports

MPR analyzed the data and produced several reports explaining the findings on topics such as satisfaction, access to care, health care use, and use of preventive services. These reports will be available on the TRICARE website at http://www.TRICARE.USD.mil:

- 1999 TRICARE Consumer Reports

National Executive Summary Report

B. ORGANIZATION OF THIS MANUAL

Chapter 2 presents the procedures used in fielding the survey. Chapter 3 explains how the database was developed. It covers naming conventions, editing procedures, record selection criteria, descriptions of all variable types, definitions of each constructed variable, the development of satisfaction and health status scales, and weighting procedures. Chapter 4 describes how the database was analyzed. This includes rules for developing response rates, the development of table and chart specifications for the National Executive Summary Report, an explanation of the dependent variables and independent variables, and the methodology for estimating the variance of estimates. The manual concludes with a series of technical appendices:

- Appendix A: Annotated questionnaire – survey questionnaire annotated with database variable names
- Appendix B: Letters sent to the respondents during the fielding of the survey
- Appendix C: Data processing architecture
- Appendix D: Plan for Data Quality – Coding Scheme
- Appendix E: Charts in the National Executive Summary Report
- Appendix F: A table mapping MTFs to the catchment area and region. The table also indicates the type of facility, such as teaching hospital or clinic, and the service affiliation of the MTF.
- Appendix G: Response rate tables for selected domains
- Appendix H: Technical Description of the 1999 TRICARE Consumer Reports
- Appendix I: SAS Code
- Appendix J: SAS Code for Statistical and Web Specificationsfor the 1999 TRICARE Consumer Reports
- Appendix K: The SUDAAN code for calculating variance estimates

Chapter 2

Survey of Adults

This chapter presents information on the survey administration cycle for the 1999 Adult Health Care Survey of DoD Beneficiaries (HCSDB), with specific details on the survey mailing cycle and the number of surveys received during the field period.

A. SURVEY OPERATIONS ACTIVITIES

The operational support for mailing the survey involved four mailings to beneficiaries between September 27, 1999 and January 26, 2000. Targeted mailings and remailings have been integrated into the mailing administration in order to increase response rates. The main mailings are the following: notification mailing, first wave of surveys mailing, reminder/thank you mailing, and second wave of surveys mailing. All mailings have been completed. The field period closed on March 7, 2000.

B. ADDRESS UPDATE ACTIVITIES PRIOR TO AND DURING SURVEY ADMINISTRATION

Upon receipt of the sample file from Mathematica Policy Research (MPR) on August 23, 1999, the addresses were examined to determine whether an address was suitable for mailing. Within each record, a priority was assigned to each address based on its source and type, e.g., Defense Enrollment Eligibility Reporting System (DEERS) residence address, DEERS unit address. Data Recognition Corporation (DRC) sent all sample records (excluding foreign countries) with sufficient address information to an outside vendor where they were interfaced with the National Change of Address (NCOA) database to obtain updated address information. Addresses outside the U. S. were not submitted, as they were not included in the NCOA database. A total of 203,855 records were sent to the NCOA prior to the first notification letter mailing. NCOA returned the updated address file to DRC and that file was integrated with the DMDC-provided data in the system used for mailing. In the notification letter mailing, the NCOA-provided address was labeled as the highest priority address in the system file and was the first address attempted. The highest priority address for each record was selected; and, for all mailings and remailings (excluding mailings with fewer than 500 pieces), address records were sorted according to first class presort postal regulations using Group 1 software[1]. Lastly, a print file[2] was created, which was used in producing the personalized cover letters.

The updating of addresses is a continuous process throughout the survey administration cycle. During survey administration, address updates are obtained in multiple ways:

- Beneficiaries self-reported information via telephone (using the 800-number system designated for calls regarding this survey), fax, or letter.
- Postal service forwarded address correction information (ACRs).

[1] The Postal Service requires a minimum of 500 pieces for presorted mail.
[2] The print file was the file of names and addresses to be printed on the cover letters.

- Postal service returned letters or packets with out-of-date forwarding (ODFs) but with new address information affixed to the envelopes.

Postal service returned letters or packets as postal non-deliverables (PNDs).

To obtain new address information for PNDs (if no other usable addresses are available), the records are submitted to one commercial credit bureau (Experian).

Address information received directly from a beneficiary is considered the most accurate and receives the highest address priority. The notification and reminder letters include a toll-free telephone number as well as numbers for faxes and collect calls (for non-U.S. beneficiaries), so that beneficiaries will be aware of an easy and free method of updating their own addresses as necessary. The next highest priority is address information received from the post office in response to the "Address Service Requested" legend printed on the carrier envelopes. This consists of a photocopy of the forwarded envelope with the change of address information noted. This information is from the post office's database of address correction cards filed by people who have moved. Additionally, the post office's electronic address correction service (ACS) is used. In this instance, address corrections are received bi-weekly in electronic format and are loaded into the address database without the need for key entry.

When a letter or survey is returned PND, the associated record is labeled to reflect that it was returned PND and that the address is invalid and therefore unusable. The record is then flagged for inclusion in the next mailing. The next-in-line address is identified for use in the next mailing. Each address within a given record is used based on its assigned priority. Once all addresses have been used, the record is flagged for inclusion in the next submission to the credit bureau, prior to the next remail. Submission to the credit bureau is a last-chance attempt to obtain updated address information.

Based on data from the final returns data set, a total of 4,975 beneficiaries have insufficient address information in the address fields (for all available addresses). Any record without a usable address was sent to the credit bureau for an address search. The credit bureau returned all records to the operations contractor with updated address information, if available. Where multiple addresses were received, only the highest priority one was loaded into the system. (Credit bureau updates included the receipt date of new address information as part of the record returned to DRC, which allowed DRC to select the address with the most recent date received.) The updates were added to the mailing file and labeled as the highest priority addresses. The mailing of letters or surveys to these beneficiaries was then conducted, following the same steps as the original mailing. In accordance with the contract requirements, records for which the address was identified as PND and without a usable address were submitted to the credit bureau prior to each mailing and remailing. Any PNDs received after the cut-off date were processed in the next batch and sent to the credit bureau.

To summarize the order in which the addresses were prioritized in the mailing system, they are shown here from highest to lowest:

- Contact from beneficiary (phone call, voice mail, fax, letter, returned survey)
- Update from post office (ACRs, ODFs)
- Update from NCOA
- Update from commercial credit bureaus
- DEERS residence address

DEERS unit address

Table 2.1a summarizes address sources by each of the four beneficiary categories. This table shows the source of the last address used for a sample member. Note that the largest number of invalid addresses was in the Active Duty categories. This may be due to the fact that this group is very mobile. Nevertheless, the majority of valid addresses still came from the DEERS database.

TABLE 2.1a

FREQUENCY OF ADDRESS SOURCES BY BENEFICIARY CATEGORY
(N=206,000)

	Active Duty Personnel	**Active Duty Family Members Under Age 65**	**Retirees and their Families Under Age 65**	**Non- Active Duty Age 65 or Over**	**Total**
No valid address	2,925 1.42%	574 0.28%	793 0.38%	683 0.33%	4975 2.42%
Live Phone Call	0 0.0%	1 0.0%	0 0.0%	0 0.0%	1 0.0%
ACR from PO	76 0.04%	21 0.01%	18 0.01%	19 0.01%	134 0.07%
Fax	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Letter Return	0 0.0%	0 0.0%	1 0.0%	0 0.0%	1 0.0%
NCOA (moved address)	6,566 3.19%	6,326 3.07%	2,937 1.43%	1,087 0.53%	16,916 8.21%
DEERS unit	11,330 5.50%	2,252 1.09%	80 0.04%	23 0.01%	13,685 6.64%
DEERS Resident	48,427 23.51%	47,616 23.1%	45,466 22.07%	25,719 12.48%	167,222 81.8%
ODF	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
Credit Experian	1,250 0.61%	196 0.10	905 0.44	619 0.30	2,970 1.44
Electronic ACR	23 0.01%	10 0.00%	21 0.01%	7 0.00%	61 0.03%
Total	70,620 34.28%	56,992 27.67%	50,224 24.38%	28,164 13.67%	206,000 100.00%

Table 2.1b summarizes the address sources for returned surveys included in the 1999 Adult HCSDB data file. At this time, the table shows that about 8,761 (10.1%) of the final data set consists of surveys from updated sources such as the 800-number system, NCOA, and the commercial credit bureau.

TABLE 2.1b

FREQUENCY OF ADDRESS SOURCES FOR RETURNED SURVEYS
(N=87,014)

Address Type	Frequency (n)	Percent of Returns
DEERS residence	75,708	87.0%
DEERS unit address	2,259	2.6%
800-number information	1,206	1.4%
Fax or mail	5	0.0%
NCOA database	5,723	6.6%
Commercial Credit Bureau (Experian)	977	1.1%
U. S. Postal Service (ACRs and ODFs)	149	0.2%
Electronic ACR	987	1.1%

NOTE: If beneficiaries returned more than one completed survey, both or all surveys were included in the numbers in Table 2.1b.

Additionally, the costs associated with each of these address sources (e.g., the costs associated with doing address traces through one credit bureau) was summarized at the conclusion of the field period. Note that these are costs associated with DRC's portion of the survey administration activities and do not include any cost incurred by TMA or the Analysis Contractor in providing address information to DRC. These costs include both vendor costs (to DRC) as well as DRC's labor expense, except where noted.

TABLE 2.2

COST TABLE BY ADDRESS TYPE

Address Type	Unit Cost	Aggregate Cost/Total Sample	Aggregate Cost/Returned Sample
DEERS residence	NSP*		
DEERS unit address	NSP*		
800-number information**	$0.62	$1,947.42/3,141	$1,316.26/2,123
Fax or mail	$0.64	$160.00/250	$143.36/224
NCOA database	$7.92 per thousand	$1,614.53/203,855	$114.29/14,430
Commercial Credit Bureau (Experian)	$1.22	$5,008.10/4,105	$1,261.48/1,034
U. S. Postal Service (ACRs and ODFs)	$0.64	$1,198.72/1,873	$240.64/376
Electronic ACR**	$0.20	$3,320.80/16,604	$735.00/3,675

* Not separately priced. Provided to contractor by Government.
** These are line charges and postal service charges only. Personnel costs are separately priced.

C. LETTER PROCESSING PROCEDURES

Mailings which did not include a survey were generated and printed with the "best available" address from the system used for mailing. This address may have been the address generated from the DEERS file, NCOA, commercial sources (Experian), through contact with the beneficiary (telephone, letter, or fax), or from the postal service (address corrections). Each letter was printed with a unique identifier in the address block and the lower right corner, so that the beneficiary could refer to the number if address corrections were requested by fax or phone. Letters and packets with surveys were sent via first class mail.

The procedure for mailing surveys was more complex. Prior to the production of letters, each record in the mailing was matched with an available survey identification number (survey ID). As each survey ID was assigned, it was also recorded in the system used for mailing. Cover letters printed with each beneficiary's assigned survey ID were generated and printed in survey ID order. The letters were paired with the matching survey lithocode[3], inserted into envelopes with postage-paid return envelopes enclosed, and sent via first class mail. A ten-percent quality control check was implemented to ensure that the surveys and letters contained the same survey ID. If an error was found, the packets were opened, examined, and the correct survey ID/lithocode combination was made.

D. SURVEY ADMINISTRATION TIMELINE

The HCSDB mailing process was designed so that each beneficiary with a usable address was sent up to four documents: a notification letter, a first wave survey, a reminder/thank-you postcard, and a second wave survey. If a beneficiary returned a survey during the first wave mailing, then a second wave survey was not be sent. If a beneficiary was identified as deceased, that record was updated as such and no longer included in the mailing process. Also, beginning with Wave 1, active refusers (those who made a verbal or written request not to participate) and beneficiaries who were permanently incapacitated, incarcerated, or ineligible for Military Health System benefits on June 1, 1999, were also excluded. In the mailing process described below and in Table 2.3, the dates cited include both the dates in which records for the mailings were selected and a print file was created, and the dates when the mailings began. The packets were usually mailed from one to five days after the print file was created.

The print file for the notification letter was created on September 27, 1999, and consisted of 205,905 letters. This file contained letters that would be sent to all beneficiaries except those who had no known address. Those records were subsequently sent to the credit bureau Experian. The notification letters were sent to notify the beneficiaries that they were selected for the survey and to provide information to the beneficiaries regarding address-updating procedures if the letters had been forwarded or had incorrect addresses. There was one remailing of the notification letter. Included in this mailing were beneficiaries where the initial notification letters were returned as postal non-deliverables or those without a known address where an address resulted from the credit bureau search. This remailing started on November 1, 1999, and was completed on November 3, 1999, and totaled 8,177 pieces. (A sample of the pre-survey notification letter is found in Appendix B.)

The first wave survey mailing, for which the print file was created on November 8, 1999, consisted of 205,114 total surveys. For Wave 1, each beneficiary received a survey, a cover letter requesting that the beneficiary complete and return the survey, and a return envelope. (A sample of the Wave 1 cover letter is found in Appendix B.)

[3] Lithocodes are the survey identification numbers printed on the survey questionnaires in a binary format, so that they can be read by the OMR scanner and converted into Arabic numbers for the data file.

The reminder/thank-you postcard mailing (for which the print file was created on November 29, 1999) consisted of 204,888 cards, with the exception of those who had been updated as deceased, ineligible, etc. The reminder/thank-you card was sent to thank the beneficiary for completing the survey and encourage the beneficiary to return the survey if one had not been completed. The reminder/thank-you card also contained address-updating procedures if the card had been forwarded or had an incorrect address. There were no remailings planned or conducted for the reminder/thank-you card. (A sample of the reminder/thank-you postcard can be found in Appendix B.)

The wave two mailing consisted of 137,575 letters, for which the print files were created on January 17, 2000 (domestic) and January 24, 2000 (foreign). The wave two mailing was sent to those beneficiaries who had not returned a completed survey, excluding those who had been updated as deceased, ineligible, etc. Each beneficiary received a survey, a cover letter, and return envelope. (A sample of the Wave 2 cover letter is found in Appendix B.)

Table 2.3 summarizes the various HCSDB mailings as recorded in the system used for the mailings. The data includes the type of mailing; the date the records were selected for inclusion in the mailing; the date the mailings were dropped at the post office; and the quantities sent.

TABLE 2.3

MAILING TIMELINE

Mailing Type	Date of Selection	Date(s) Mailed	N Sent
Notification Letter	9/27/99	9/28-10/4/99	205,905*
Notification Remail #1	10/31/99	11/1-11/3/99	8,177
Wave 1	11/8/99	11/12-11/20/99	205,114*
Reminder/Thank You	11/29/99	12/3/99	204,888*
Wave 2 – domestic	1/17/00	1/18-1/25/00	137,162
Wave 2 – foreign	1/24/00	1/26/00	413

* Includes foreign and domestic addresses in sample.

E. PROCESSING AND CLASSIFICATION OF INCOMING SURVEYS

Incoming survey forms were visually checked prior to scanning. At that point, surveys were separated into “completed” or “blank” groups. This year, all returned surveys also contained a bar code to enable up-to-the-minute electronic tracking of all returned surveys. The bar code was scanned at the time the survey was received to provide an electronic receipt of all returned surveys and track their status in the receiving and scanning process. Blank forms were further divided into batches according to the reason (if any) the beneficiary wrote on the returned form. A respondent’s reason for returning a blank or partially completed form was recorded in the mailing system. Surveys were then optically scanned so that lithocodes could be captured and tracked. This tracking of survey IDs was used to identify whether a beneficiary returned a survey or not and to record the reason given for a blank return.

Blank forms without an explanation for their return were tracked by survey identification codes. Counts of all incoming forms were updated as they were received. All of these documents were optically scanned and edited. Surveys that were damaged or completed in ink were key entered[4]. Scanned survey questions with multiple answers were checked to ensure that the multiple answers were not due to a scanning error (i.e., the scanner erroneously picked up an erased answer as a response).

Throughout the administration of HCSDB, returned surveys were tracked in the mailing system and returns files as surveys were returned; mail was returned PND; and information was received by fax or telephone. A final disposition variable (FLAG_FIN) was developed to classify incoming surveys, and to classify cases where the beneficiary did not return a survey. The disposition values and outcomes are:

- FLAG_FIN=1

  Returned survey – survey was completed and returned.

- FLAG_FIN=2

  Returned ineligible – survey was returned with at least one question marked and information that the beneficiary was ineligible. The information indicating ineligibility may have come by phone, fax, or the survey itself.

- FLAG_FIN=3

  Returned blank – temporarily ill or incapacitated. Survey was returned blank along with information that the beneficiary was temporarily ill or incapacitated. These sample members were eligible.

- FLAG_FIN=4

  Returned blank – deceased. Survey was returned blank along with information that the beneficiary was deceased. These sample members were also ineligible.

- FLAG_FIN=5

  Returned blank – incarcerated or permanently incapacitated. Survey was returned blank along with information that the beneficiary was incarcerated or permanently hospitalized. These sample members were ineligible.

- FLAG_FIN=6

  Returned blank – left military or divorced after 6/1/99, retired. Survey was returned blank along with information that the beneficiary left the military after 6/1/99, divorced after 6/1/99, or retired. These sample members were eligible.

- FLAG_FIN=7

  Returned blank – not eligible on 6/1/99. Survey was returned blank along with information that the beneficiary was not eligible for Military Health System Plan on 6/1/99. These sample members were ineligible.

- FLAG_FIN=8

  Returned blank – other eligible. Survey was returned blank along with a reason given by the sample member. These sample members were eligible.

[4] All data captured via keying was keyed and verified, yielding an accuracy rate of 99.6%.

- FLAG_FIN=9

  Returned blank – no reason. Survey was returned blank without an explanation. These sample members were eligible.

- FLAG_FIN=10

  No return – temporarily ill or incapacitated. Survey was not returned, beneficiary was temporarily ill or incapacitated. These sample members were eligible.

- FLAG_FIN=11

  No return – active refuser. Survey was not returned, beneficiary refused to take part in the survey. These sample members were eligible.

- FLAG_FIN=12

  No return – deceased. Survey was not returned, beneficiary deceased. These sample members were ineligible.

- FLAG_FIN=13

  No return – incarcerated or permanently incapacitated. Survey was not returned, beneficiary was incarcerated or permanently hospitalized. These sample members were ineligible.

- FLAG_FIN=14

  No return – left military or divorced after 6/1/99, retired. Survey was not returned, beneficiary left service after 6/1/99, divorced after 6/1/99, or retired. These sample members were eligible.

- FLAG_FIN=15

  No return – not eligible on 6/1/99. Survey was not returned, beneficiary was not eligible for Military Health System Plan on 6/1/99. These sample members were ineligible.

- FLAG_FIN=16

  No return – other eligible. Survey was not returned, beneficiary gave other reason for not completing the survey. These sample members were eligible.

- FLAG_FIN=17

  No return – no reason. Survey was not returned, beneficiary gave no reason.

- FLAG_FIN=18

  PND – no address remaining. All addresses were attempted, mailing was returned PND.

- FLAG_FIN=19

  PND – address remaining at the close of field. At the close of field, the last address used was found invalid, next available was not attempted.

- FLAG_FIN=20

  Original Non-Locatable – no address at start of mailing. Substantially incomplete or blank address field before the survey was administered, no mailings attempted.

- FLAG_FIN=21

  Beneficiary provides written documentation declining to participate but doesn't specify a reason.

- FLAG_FIN=22

  Beneficiary indicates they are hospitalized but without providing any way to determine whether incapacity is temporary or permanent. Therefore, eligibility determination can not be made.

Table 2.4 documents the final disposition data of the survey sample by each beneficiary group as recorded in the system used for mailing. Some beneficiaries did not return a survey and they provided a reason why the survey was not returned (i.e., FLAG_FIN values of 3-9). Beneficiaries provided this information through various sources, including collect and 800-number calls, faxes, and letters.

TABLE 2.4

FREQUENCY (N) AND PERCENT DISTRIBUTION OF FINAL DISPOSITION OF SURVEY SAMPLE BY BENEFICIARY GROUP[1]

Final Survey Disposition[2]	Active Duty Personnel	Active Duty Family Members Under Age 65	Retirees and their Families Under Age 65	Non- Active Duty Age 65 or Over	Total
Returned non-blank survey	18,921 9.18%	18,721 9.08%	27,439 13.31%	20,425 9.90%	85,506 41.46%
Returned ineligible	145 0.07%	107 0.05%	174 0.08%	312 0.15%	738 0.36%
No return (temporarily ill, incapacitated)	0 0.0%	2 0.0%	1 0.0%	6 0.0%	9 0.0%
Blank (temporarily ill)	0 0.0%	0 0.0%	4 0.0%	12 0.01%	16 0.01%
Blank (deceased)	3 0.0%	7 0.0%	38 0.02%	194 0.09%	242 0.12%
Blank (permanently ill)	0 0.0%	0 0.0%	2 0.0%	39 0.02%	41 0.02%
Blank (left military)	15 0.01%	17 0.01%	6 0.0%	8 0.0%	46 0.02%
Blank (ineligible for MHS)	2 0.0%	6 0.0%	11 0.01%	5 0.0%	24 0.01%
Blank (other eligible)	36 0.02%	32 0.02%	50 0.02%	35 0.02%	153 0.07%
Blank (no reason)	41 0.02%	43 0.02%	51 0.02%	77 0.04%	212 0.10%
No return (active refuser)	64 0.03%	45 0.02%	44 0.2%	20 0.01%	173 0.08%
No return (deceased)	4 0.0%	9 0.0%	69 0.03%	314 0.15%	396 0.19%
No return (permanently ill)	1 0.0%	1 0.0%	3 0.0%	15 0.01%	20 0.01%
No return (left military)	26 0.01%	52 0.03%	13 0.01%	4 0.0%	95 0.05%
No return (ineligible MHS)	3 0.0%	10 0.0%	7 0.0%	7 0.0%	27 0.01%
No return (other eligible)	6 0.00%	23 0.01%	24 0.01%	23 0.01%	76 0.04%
No return (no reason)	47,841 23.20%	36,951 17.92%	21,479 10.42%	6,041 2.93%	112,312 54.46%
PND (no address remaining)	2,855 1.38%	563 0.27%	774 0.38%	643 0.31%	4,835 2.34%
PND (address left)	641 0.31%	443 0.21%	69 0.03%	15 0.01%	1,168 0.57%
Non-locatable (no address at start of mailing)	58 0.03%	9 0.0%	7 0.0%	21 0.01%	95 0.05%
Decline to participate	5 0.0%	7 0.0%	13 0.01%	11 0.01%	36 0.02%
Total	70,667 34.27%	57,048 27.66%	50,278 24.38%	28,227 13.69%	206,000 100.00%

[1] Taken from BGCSMPL.
[2] Taken from FLAG_FIN.

NOTE: The data in this final version are provided by Data Recognition Corporation. Duplicate records have not been removed. The actual sample size is 205,994.

The data in Table 2.5 presents the final disposition for all incoming surveys by another created variable: FLAG_DUP as recorded in the Returns File. Please note column percents may not total 100% due to rounding. FLAG_DUP was developed to identify beneficiaries who returned more than one survey. Each survey was examined to determine whether the survey was from the first wave mailing or the second wave mailing. The data in Table 2.5 presents the final disposition for all incoming surveys.

TABLE 2.5

SURVEY WAVE INDICATOR[1] BY FINAL DISPOSITION[2]

Survey Wave Indicator	Wave [1]	Wave [2]	Total
Returned non-blank survey	65,411 75.14%	20,095 23.10%	85,506 98.27%
Returned blank (deceased)	131 0.15%	111 0.13%	242 0.28%
Returned blank (temporarily ill, hospitalized, etc.)	13 0.01%	3 0.0%	16 0.02%
Returned blank (other reasons – eligible)	31 0.04%	122 0.14%	153 0.18%
Returned blank (no reason)	137 0.15%	75 0.09%	212 0.24%
Returned (ineligible)	483 0.55%	255 0.29%	738 0.85%
Blank (permanently ill)	11 0.01%	30 0.03%	41 0.05%
Blank (left military)	8 0.01%	38 0.04%	46 0.05%
Blank (ineligible for MHS)	1 0.0%	23 0.03%	24 0.03%
Decline to participate	30 0.03%	6 0.01%	36 0.04%
Total	66,256 76.14%	20,758 23.85%	87,014 100.00%

[1] Taken from FLAG_DUP.
[2] Taken from FLAG_FIN.

Note: This table was generated with data obtained prior to removal of any duplicate records from the file.

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Chapter 3

Database

This chapter explains the process of developing the raw survey data into a final database free of inconsistencies and ready for analysis. We discuss the design of the database; cleaning, editing, and implementing the Coding Scheme; record selection; and constructing variables.

A. DATABASE DESIGN

The 1999 Adult HCSDB consists of variables from various sources. When DRC delivered the file to MPR after fielding the sample, the following types of variables were present:

- DEERS information on beneficiary group, social security number, sex, age, etc.
- Sampling variables used to place beneficiaries in appropriate strata
- Questionnaire responses

DRC information from fielding the sample, such as scan date and flags developed during the fielding to assist us in determining eligibility

MPR added the following types of variables to the database:

- Updated DEERS variables from the time of data collection to be used for post-stratification
- Coding Scheme flags
- Constructed variables for analysis

Weights

In addition, MPR updated and cleaned the questionnaire responses using the coding scheme tables found in Appendix D. This year the final file does not include both the original and recoded responses, but only the cleaned responses; this will help users to avoid using an uncleaned response for analysis. We structured the final database so that all variables from a particular source are grouped by position. Table 3.1 lists all variables in the database by source and briefly describes these sources. For specific information on variable location within the database, refer to the "1999 Adult Health Care Survey of DoD Beneficiaries: Adult Codebook and User's Guide."

1. Data Sources

a. DEERS

DMDC provided the sampling frame to MPR prior to the selection of the sample. DEERS information such as sex, date of birth, and service are retained in the database; this data is current as of the time of sample selection.

b. Sampling Variables

MPR developed variables during the sample selection procedure that were instrumental in placing beneficiaries in appropriate strata. Many of the variables are retained on the database.

c. Questionnaire Responses

These variables represent the cleaned values for all responses to the questionnaire. The original values scanned in by DRC are cleaned and recoded as necessary to ensure that responses are consistent throughout the questionnaire. The coding scheme tables found in Appendix D are the basis for insuring data quality.

d. Survey Fielding Variables

In the process of fielding the survey, DRC created a number of variables that we retain in the database. Certain of these variables, information that came in by phone, for example, assist us in determining eligibility.

e. Coding Scheme Flags

Each table of the Coding Scheme (see Appendix D) has a flag associated with it that indicates the pattern of original responses and any recodes that were done. For example, the table for Note 5 has a flag N5.

f. Updated DEERS data

In December 1999, DMDC provided MPR with updated DEERS information for the sample so that information on TRICARE enrollment and geographic location would be current as of the time of data collection.

g. Constructed Variables

MPR constructed additional variables that were used in the National Executive Summary report and adult report cards. Often these variables were regroupings of questionnaire responses or the creation of a binary variable to indicate whether or not a TRICARE standard was met. Complete information on each constructed variable is found in section 3.D.

h. Weights

MPR developed weights for each record in the final database. Weights are required for the following reasons:

- To compensate for variable probabilities of selection
- To adjust for differential response rates

To improve the precision of survey-based estimates through post-stratification

Weighting procedures are discussed in section 3.E.

TABLE 3.1

VARIABLES IN THE 1999 ADULT HCSDB DATA FILE

Name	Content/Topic
	SAMPLING VARIABLES
MPRID	Unique MPR identifier
BFGROUP	Beneficiary group (uncollapsed)
MPCSMPL	Sampling rank
SVCSMPL	Sampling service
AGESMPL	Sampling age
SEXSMPL	Sampling sex
STRATUM	Sampling stratum
	DEERS VARIABLES
MSTATUS	Marital status
RACE	Race/Ethnicity
SEX	Sex
SVC	Service
GROUP	Group code
SERVAFF	Service affiliation
	UPDATED DEERS AND SAMPLING VARIABLES
ZTSPNE	TSP site for non-enrollees
ZTYPE	Record type
DDS	DEERS dependent suffix
ZSTATUS	Status of sponsor
ZAGE	Beneficiary age as of September 30, 1999
ZCATCHID	DMIS catchment/non-catchment ID
ZACV	Alternate care value
ZENRID	Enrollment DMIS ID
ZTSPSITE	TSP HCFA site code
ZPCMD	PCM derived
ZELIG	Eligibility flag
ZTSPELIG	TSP eligibility flag
BFGROUPP	Beneficiary group from DEERS file September 30, 1999
AGEGROUP	Age group as of September 30, 1999
ENGROUPP	Enrollment group as of September 30, 1999
CELLP	Catchment area post-cell
CACSMPL	Catchment area from DEERS file September 30, 1999
POSTSTR	Post-stratification identifier

Name	Content/Topic
FNSTATUS	Final status
KEYCOUNT	Number of key questions answered
	QUESTIONNAIRE RESPONSES
H99001	Are you the person listed on the mailing label of the envelope this questionnaire came in?
H99002	Which health plan did you use most in the last 12 months?
H99003	Are you currently enrolled in TRICARE Prime or Senior Prime?
H99004	Out of the last 12 months, how many months in a row have you been covered by TRICARE Prime?
H99005	As a member of TRICARE Prime, did you have a primary care manager based in a military or civilian facility?
H99006	In the last 12 months, did you usually use providers who were in the TRICARE Extra network?
H99007A	What health plan or health plans are you currently covered by - None?
H99007B	What health plan or health plans are you currently covered by - TRICARE Prime?
H99007C	What health plan or health plans are you currently covered by - TRICARE Senior Prime?
H99007D	What health plan or health plans are you currently covered by - TRICARE Extra/Standard (CHAMPUS)?
H99007E	What health plan or health plans are you currently covered by - Medicare Part B?
H99007F	What health plan or health plans are you currently covered by - CHAMPUS Supplemental health plan?
H99007G	What health plan or health plans are you currently covered by - Medigap health plan?
H99007H	What health plan or health plans are you currently covered by - Federal Employees Health Benefits Program (FEHBP)?
H99007I	What health plan or health plans are you currently covered by - Medicaid?
H99007J	What health plan or health plans are you currently covered by - Other civilian health plan?
H99007K	What health plan or health plans are you currently covered by - Other?
H99007L	What health plan or health plans are you currently covered by - I don't know?
H99008	Not counting when you were sick or pregnant, when was the last time you had a general medical or physical examination or checkup?
H99009A	When did you last have a blood pressure reading?
H99009B	Do you know if your blood pressure is too high or not?
H99010	When did you last have a cholesterol screening, that is, a test to determine the level of cholesterol in your blood?
H99011	When did you last have a flu shot?
H99012	Have you ever smoked at least 100 cigarettes in life?
H99013	Do you now smoke everyday, some days or not at all?
H99014	How long has it been since you quit smoking cigarettes?
H99015	In the last 12 months, on how many visits were you advised to quit smoking by a doctor or other health provider in your plan?
SRSEX	Are you male or female?
H99017	When was the last time you had a prostate gland examination or blood test for prostate disease?

Name	Content/Topic
H99018	When did you last have a Pap smear test?
H99019A	Are you under age 40?
H99019B	When was the last time your breasts were checked by mammography?
H99019C	When was the last time you had a breast physical exam by a health care professional?
H99020	Have you been pregnant in the last 12 months or are you pregnant now?
H99021A	In what trimester is your pregnancy?
H99021B	In which trimester did you first receive prenatal care?
H99022	When you joined your health plan or at any time since then, did you get a new personal doctor or nurse?
H99023	With the choices your health plan gave you, how much of a problem, if any, was it to get a personal doctor or nurse you are happy with?
H99024	Do you have one person you think of as your personal doctor or nurse?
H99025	We want to know your rating of your personal doctor or nurse.
H99026	In the last 12 months, did you or a doctor think you needed to see a specialist?
H99027	In the last 12 months, how much of a problem, if any, was it to get a referral to a specialist that you needed to see?
H99028	In the last 12 months, did you see a specialist?
H99029	In the last 12 months, when you needed an appointment with a specialist, such as a surgeon, allergy, or skin doctor, how often did you have to wait more than the time requested by the referring provider?
H99030	We want to know your rating of the specialist you saw most often in the last 12 months, including a personal doctor if he or she was a specialist.
H99031	In the last 12 months, was the specialist you saw most often the same doctor as your personal doctor?
H99032	In the last 12 months, did you call a doctor's office or clinic during regular office hours to get help or advice for yourself?
H99033	In the last 12 months, when you called during regular office hours, how often did you get the help or advice you need?
H99034	In the last 12 months, did you call your regional health care advice and education line sometimes referred to as the Healthcare Information Line (HCIL)?
H99035	In the last 12 months, when you called your regional advice line, how often did you get the help or advice you needed for yourself?
H99036	In the last 12 months, how often did you have to make 3 or more phone calls, when attempting to make an appointment for yourself with a health care professional?
H99037	In the last 12 months, what type of facility did you go to most often for health care?
H99038	In the last 12 months, did you go to an emergency room for your own care?
H99039A	What were the reasons you used an emergency room for your own care - I was injured or acutely ill and needed to be seen right away?
H99039B	What were the reasons you used an emergency room for your own care - A health care provider, advice line, or clinic staff advised me to go there?
H99039C	What were the reasons you used an emergency room for your own care - It was after regular doctor's office or clinic hours?

Name	Content/Topic
H99039D	What were the reasons you used an emergency room for your own care - It was out of the area or away from home?
H99039E	What were the reasons you used an emergency room for your own care - It was less expensive for me?
H99039F	What were the reasons you used an emergency room for your own care - It was more convenient for me?
H99039G	What were the reasons you used an emergency room for your own care - I couldn't get off work during regular doctor's office or clinic hours?
H99039H	What were the reasons you used an emergency room for your own care - It was difficult to get an appointment at a doctor's office or clinic
H99039I	What were the reasons you used an emergency room for your own care - Not sure?
H99039J	What were the reasons you used an emergency room for your own care - I did not go to an emergency room in the last 12 months?
H99040	In the last 12 months (not counting times you went to an emergency room) how many times did you go to a doctor's office in a military health care facility to get care for yourself?
H99041	In the last 12 months (not counting times you went to an emergency room) how many times did you go to a doctor's office in a civilian health care facility to get care for yourself?
H99042	In the last 12 months, when you needed a well-patient visit, such as a physical exam or check-up, how often did you have to wait 4 or more weeks?
H99043	In the last 12 months, when you needed an appointment for a routine visit, for health problems that were not urgent, how often did you have to wait more than 7 days?
H99044	In the last 12 months, when you needed urgent care for an acute (serious) illness or injury, such as a broken arm or shortness of breath, how often did you get care within 24 hours?
H99045	In the last 12 months, how often did it take you more than 30 minutes to travel to the facility where you visit your primary care manager?
H99046	In the last 12 months, how often did you wait in the doctor's office or clinic more than 30 minutes past the appointment time to see the person you went to see?
H99047	In the last 12 months, how much of a problem, if any, was it to get care for yourself that you or a doctor believed necessary?
H99048	In the last 12 months, how much of a problem, if any, were delays in your health care while you waited for approval from your health plan?
H99049	In the last 12 months, how often did office staff at a doctor's office or clinic treat you with courtesy and respect?
H99050	In the last 12 months, how often were office staff at a doctor's office or clinic as helpful as you thought they should be?
H99051	In the last 12 months, how often did doctors or other health providers listen carefully to you?
H99052	In the last 12 months, how often did doctors or other health providers explain things in a way you could understand?
H99053	In the last 12 months, how often did doctors or other health providers show respect for what you had to say?
H99054	In the last 12 months, how often did doctors or other health providers spend enough time with you?
H99055	We want to know your rating of all your health care in the last 12 months from all doctors and other providers.

Name	Content/Topic
H99056	In the last 12 months, how many prescriptions did you have that were written by a civilian provider but were filled at a military pharmacy?
H99057	In the last 12 months, did you or anyone else send in any claims for yourself to your health plan?
H99058	In the last 12 months, how often did your health plan handle your claims in a reasonable time?
H99059	In the last 12 months, how often did your health plan handle your claims correctly?
H99060	In the last 12 months, before you went for care, how often did your health plan make it clear how much you would have to pay?
H99061A	In the last 12 months, how much "out-of-pocket" money did you and your family members who were eligible for your military medical benefits spend on medical care, including premiums, enrollment fees, deductibles, co-insurance, and co-payments, that was not reimbursed by a health plan - No expenses in the last 12 months?
H99061B	In the last 12 months, how much "out-of-pocket" money did you and your family members who were eligible for your military medical benefits spend on medical care, including premiums, enrollment fees, deductibles, co-insurance, and co-payments, that was not reimbursed by a health plan - Out-of-pocket?
H99062	In the last 12 months, did you look for any information in written materials from your health plan?
H99063	In the last 12 months, how much of a problem, if any, was it to find or understand information in the written materials?
H99064	In the last 12 months, did you call the health plan's customer service to get information or help?
H99065	In the last 12 months, how much of a problem, if any, was it to get the help you needed when you called your health plan's customer service?
H99066	In the last 12 months, did you have any experiences with paperwork for your health plan?
H99067	In the last 12 months, how much of a problem, if any, did you have with paperwork for your health plan?
H99068	In the last 12 months, have you called or written your health plan with a complaint or problem?
H99069	How long did it take for your health plan to resolve your complaint?
H99070	Was your complaint or problem settled to your satisfaction?
H99071	We want to know your rating of all your experience with your health plan.
H99072	If you are currently enrolled in TRICARE Prime, how likely are you to disenroll from TRICARE Prime for a different type of health plan in the next 12 months?
H99073	If you are not currently enrolled in TRICARE Prime, how likely are you to enroll in TRICARE Prime in the next 12 months?
H99074	Has TRICARE had any effect on your decision whether or not to enroll in a civilian health plan?
H99075	Has TRICARE had any effect on your decision whether or not to be covered by CHAMPUS supplemental insurance or Medicare supplement insurance?
H99076A	Please indicate how you feel about your TRICARE health plan - has limited your ability to get the health care you need?
H99076B	Please indicate how you feel about your TRICARE health plan - has limited your ability to see the doctors of your choice?
H99076C	Please indicate how you feel about your TRICARE health plan - does not have good enough health benefits?
H99076D	Please indicate how you feel about your TRICARE health plan - costs too much?

Name	Content/Topic
H99076E	Please indicate how you feel about your TRICARE health plan - you have recently left the military and don't like the transitional health plan, called the Continuing Health Care Benefits Program or CHCBP?
H99076F	Please indicate how you feel about your TRICARE health plan - the military reneged on its promise of free lifetime health care?
H99076G	Please indicate how you feel about your TRICARE health plan - you don't like TRICARE in general?
H99077	In general, how would you say your health is?
H99078A	Does your health now limit you in - Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf?
H99078B	Does your health now limit you in - Climbing several flights of stairs?
H99079A	During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health - Accomplished less than you would like?
H99079B	During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health - Were limited in the kind of work or other activities?
H99080A	During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious) - Accomplished less than you would like?
H99080B	During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious) - Did work or other activities less carefully than usual?
H99081	During the past 4 weeks, how much did pain interfere with your normal work (including work both outside the home and housework)?
H99082A	How much time during the past 4 weeks - Have you felt calm and peaceful?
H99082B	How much time during the past 4 weeks - Did you have a lot of energy?
H99082C	How much time during the past 4 weeks - Have you felt downhearted and depressed?
H99083	During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?
H99084	Are you Spanish/Hispanic/Latino?
SRRACEA	What is your race - White?
SRRACEB	What is your race - Black or African American?
SRRACEC	What is your race - American Indian or Alaska Native?
SRRACED	What is your race - Asian (e.g., Asian Indian, Chinese, Filipino, Japanese, Korean, or Vietnamese)?
SRRACEE	What is your race - Native Hawaiian or other Pacific Islander (e.g., Samoan, Guamanian, or Chamorro)?
SREDA	What is the highest grade or level of school that you have completed - 8th grade or less?
SREDB	What is the highest grade or level of school that you have completed - Some high school, but did not graduate?
SREDC	What is the highest grade or level of school that you have completed - High school graduate or GED?
SREDD	What is the highest grade or level of school that you have completed - Some college or 2-year degree?

Name	Content/Topic
SREDE	What is the highest grade or level of school that you have completed - 4-year college graduate?
SREDF	What is the highest grade or level of school that you have completed - More than 4-year college degree?
H99087A	During the last 12 months, how many days of paid work did you miss due to your own illness or injury - I didn't miss any paid work days?
H99087B	During the last 12 months, how many days of paid work did you miss due to your own illness or injury - Missed paid work days?
H99088	How long have you lived in your current local area?
SREDHIGH	Highest school grade completed
	DRC SURVEY FIELDING VARIABLES
FLAG_FIN	Final disposition
REFUSE	Refused
BLKREAS	Reason survey returned blank
DUPFLAG	Multiple response indicator
	CODING SCHEME FLAGS AND COUNTS
N1	Coding Scheme flag for Note 1
N2	Coding Scheme flag for Note 2
N3	Coding Scheme flag for Note 3
N4A	Coding Scheme flag for Note 4A
N4B	Coding Scheme flag for Note 4B
N4C	Coding Scheme flag for Note 4C
N5	Coding Scheme flag for Note 5
N6	Coding Scheme flag for Note 6
N7	Coding Scheme flag for Note 7
N8	Coding Scheme flag for Note 8
N9	Coding Scheme flag for Note 9
N10	Coding Scheme flag for Note 10
N11	Coding Scheme flag for Note 11
N12	Coding Scheme flag for Note 12
N13	Coding Scheme flag for Note 13
N14	Coding Scheme flag for Note 14
N15	Coding Scheme flag for Note 15
N16	Coding Scheme flag for Note 16
N17	Coding Scheme flag for Note 17
N18	Coding Scheme flag for Note 18
N19	Coding Scheme flag for Note 19
N20	Coding Scheme flag for Note 20
N22	Coding Scheme flag for Note 22

Name	Content/Topic
N23	Coding Scheme flag for Note 23
MISS_9	Count of no response (invalid skip)
MISS_8	Count of multiple response errors
MISS_7	Count of out-of-range errors
MISS_6	Count of not applicable/valid skips
MISS_5	Count of scalable response of "don't know" or "not sure"
MISS_4	Count of incomplete grid errors
MISS_1	Count of skip pattern violations
MISS_TOT	Total number of missing responses
	CONSTRUCTED VARIABLES
XREGION	Beneficiary's regional assignment (15 regions and unassigned) (see page 38)
CONUS	CONUS/OCONUS Indicator (see page 39)
XENRLLMT	Beneficiary's enrollment status in TRICARE Prime (see page 42)
XENR_PCM	TRICARE Enrollment by PCM type (see page 42)
XINS_COV	Insurance Coverage (see page 43)
XQENROLL	TRICARE Enrollment according to questionnaire responses (see page 43)
XSEXA	Beneficiary's sex- Male or Female (see page 40)
XBNFGRP	Beneficiary group with population age 65 and over excluded from Active Duty and Family Members of Active Duty (see page 41)
KENRINTN	Intention to enroll, coded as binary form 1 / 2 (see page 45)
KDISENRL	Intention to disenroll, coded as binary form 1 / 2 (see page 45)
KMILWAT1	Waited less than 4 weeks for well-patient visit at military facility, coded in binary form 1 / 2 (see page 45)
KCIVWAT1	Waited less than 4 weeks for well-patient visit at civilian facility, coded in binary form 1 / 2 (see page 45)
KMILOFFC	Waited less than 30 minutes at military facility, coded in binary form 1 / 2 (see page 45)
KCIVOFFC	Waited less than 30 minutes at civilian facility, coded in binary form 1 / 2 (see page 45)
KBGPRB1	Big problem getting referrals to a specialist coded in binary form 1 / 2 (see page 45)
KBGPRB2	Big problem getting necessary care coded in binary form 1 / 2 (see page 45)
KMILOP99	Outpatient visits to military facility (see page 53)
KCIVOP99	Outpatient visits to civilian facility (see page 53)
KPRSCPTN	7 or more civilian prescriptions filled by military pharmacy, coded in binary form 1/2 (see page 53)
HP_PRNTL	If pregnant in the last year, received prenatal care in first trimester, coded in binary form 1 / 2 (see page 50)
HP_MAMOG	Women age 50 and over, had a mammogram within past 2 years, coded in binary form 1 / 2 (see page 50)
HP_PAP	For all women, had a pap smear in last 3 years, coded in binary form 1 / 2 (see page 50)
HP_BP	Had a blood pressure check in last 2 years and know results, coded in binary form 1 / 2 (see page 50)

Name	Content/Topic
HP_FLU	For persons age 65 and older, had a flu shot in last 12 months, coded in binary form 1 / 2 (see page 50)
HP_PROS	For men age 50 and over, had a prostate exam within last 12 months, coded in binary form 1 / 2 (see page 50)
HP_GP	Had a general medical or physical examination or checkup in the last 12 months. (see page 50)
HP_CHOL	Had a cholesterol screening in the past 5years. (see page 50)
HP_BRST	For all women age 40 and older, had a breast physical exam in the past 12 months. (see page 50)
HP_SMOKE	For all current adult smokers and those who quit smoking within the past year, were advised to quit smoking by a health provider in the past 12 months (see page 50)
KCIVINS	Beneficiary is covered by civilian insurance
KMEDIGAP	Beneficiary is covered by Medigap
KCOST_2	Out-of-pocket costs greater than $200
SF12PCS	SF12 Physical Health Summary Score – Average (see page 46)
SF12MCS	SF12 Mental Health Summary Score – Average (see page 46)
KMID_H	Physical Health Status (age-adjusted) below the median, coded in binary form 1 / 2 (see page 46)
KMID_MH	Mental Health Status (age-adjusted) below the median, coded in binary form 1 / 2 (see page 46)
	WEIGHTS
BWT99	Base-sample weight
WRWT99	Final weight
WRWT1	Replicated/Jackknife weight 1
WRWT2	Replicated/Jackknife weight 2
WRWT3	Replicated/Jackknife weight 3
WRWT4	Replicated/Jackknife weight 4
WRWT5	Replicated/Jackknife weight 5
WRWT6	Replicated/Jackknife weight 6
WRWT7	Replicated/Jackknife weight 7
WRWT8	Replicated/Jackknife weight 8
WRWT9	Replicated/Jackknife weight 9
WRWT10	Replicated/Jackknife weight 10
WRWT11	Replicated/Jackknife weight 11
WRWT12	Replicated/Jackknife weight 12
WRWT13	Replicated/Jackknife weight 13
WRWT14	Replicated/Jackknife weight 14
WRWT15	Replicated/Jackknife weight 15
WRWT16	Replicated/Jackknife weight 16
WRWT17	Replicated/Jackknife weight 17
WRWT18	Replicated/Jackknife weight 18
WRWT19	Replicated/Jackknife weight 19

Name	Content/Topic
WRWT20	Replicated/Jackknife weight 20
WRWT21	Replicated/Jackknife weight 21
WRWT22	Replicated/Jackknife weight 22
WRWT23	Replicated/Jackknife weight 23
WRWT24	Replicated/Jackknife weight 24
WRWT25	Replicated/Jackknife weight 25
WRWT26	Replicated/Jackknife weight 26
WRWT27	Replicated/Jackknife weight 27
WRWT28	Replicated/Jackknife weight 28
WRWT29	Replicated/Jackknife weight 29
WRWT30	Replicated/Jackknife weight 30
WRWT31	Replicated/Jackknife weight 31
WRWT32	Replicated/Jackknife weight 32
WRWT33	Replicated/Jackknife weight 33
WRWT34	Replicated/Jackknife weight 34
WRWT35	Replicated/Jackknife weight 35
WRWT36	Replicated/Jackknife weight 36
WRWT37	Replicated/Jackknife weight 37
WRWT38	Replicated/Jackknife weight 38
WRWT39	Replicated/Jackknife weight 39
WRWT40	Replicated/Jackknife weight 40

2. Variable Naming Conventions

To preserve continuity with survey data from previous years, MPR followed the same variable naming conventions used for the 1996, 1997, and 1998 survey data with a few exceptions. Variable naming conventions for the 1999 Adult HCSDB are shown in Table 3.2. The suffix "__O" will be used to distinguish the original version of the variable from the recoded version. Unlike last year, recoded variables will ***not*** have the suffix "__R". The public use files for the adult survey will contain only recoded variables.

3. Missing Value Conventions

The 1999 conventions for missing variables are the same as the 1998 conventions. All missing value conventions used in the 1999 HCSDB are shown in Table 3.3

TABLE 3.2

NAMING CONVENTIONS FOR 1999 ADULT HCSDB VARIABLES
(VARIABLES REPRESENTING SURVEY QUESTIONS)

1st Character: Survey Type	2nd – 3rd Characters: Survey Year	4th – 6th Characters: Question #	Additional Characters: Additional Information
H= Health Beneficiaries (18 and Older, adult questionnaire)	99	001 to 088	A to L are used to label responses associated with a multiple response question --- _O denotes the original version of a recoded variable

(Constructed Variables)

1st Characters: Variable Group	Additional Characters: Additional Information
SR=Self-reported demographic Data	Descriptive text, e.g., SREDHIGH
N=Coding scheme notes	Number referring to Note, e.g., N2
X=Constructed independent variable	Descriptive text, e.g., XREGION
HP=Constructed Healthy Person 2000 variable	Descriptive text, e.g., HP_BP (had blood pressure screening in past two years and know the results)
SF12=SF-12 Health Status variables	Descriptive text, e.g., SF12PCS, SF12MCS (physical and mental health scores)
K=Constructed dependent variables	Descriptive text, e.g., KMILOP99 (total number of outpatient visits to military facility)
Z=Post stratification variable	Descriptive text, e.g., ZAGE

TABLE 3.3

CODING OF MISSING DATA AND "NOT APPLICABLE" RESPONSES

ASCII or Raw Source Data	Edited and Cleaned SAS Data	Description
Numeric	Numeric	
-9	.	No response
-8	.A	Multiple response error
-7	.O	Out of range error
-6	.N	Not applicable or valid skip
-5	.D	Scalable response of "Don't know" or "Not sure"
-4	.I	Incomplete grid error
-1	.C	Question should have been skipped, not answered
	.B	No survey received

B. CLEANING AND EDITING

Data cleaning and editing procedures ensure that the data are free of inconsistencies and errors. Standard edit checks include the following:

- Checks for multiple surveys returned for any one person
- Checks for multiple responses to any question that should have one response
- Range checks for appropriate values within a single question
- Logic checks for consistent responses throughout the questionnaire

We computed frequencies and cross tabulations of values at various stages in the process to verify the accuracy of the data. Data editing and cleaning proceeded in the following way:

1. Scan Review

DRC spot checked the scanned results from the original survey to verify the accuracy of the scanning process and made any necessary corrections by viewing the returned survey.

2. Additional DRC Editing and Coding

In preparing the database for MPR, DRC used variable names and response values provided by MPR in the annotated questionnaire (see Appendix A). DRC delivered to MPR a database in SAS format. In this database, any questions with no response were encoded with a SAS missing value code of '.'. Also, as part of the scanning procedure, DRC entered the SAS missing value of '.A' for any question with multiple responses where a single response was required. Multiple column grids, such as the one for out-of-pocket expenses, that were not filled in completely were given the SAS missing value of '.I'; there were two exceptions to this rule:

- If there was a response in the right column(s) and none in the left column(s), the field was zero-filled rather than coded as an incomplete grid

If there was a response in the left column(s) and none in the right column(s), the field was right-adjusted and then zero-filled rather than coded as an incomplete grid

3. Duplicate or Multiple Surveys

At this stage, DRC delivered to MPR a file containing one record for every beneficiary in the sample, plus additional records for every duplicate survey or multiple surveys received from any beneficiary. These duplicates and multiples were eliminated during record selection, and only the most complete questionnaire in the group was retained in the final database. Record selection is discussed in Section 3.D.

4. Removal of Sensitive or Confidential Information

The file that MPR received from DRC contained sensitive information such as Social Security Number (SSN). Any confidential information was immediately removed from the file. Each beneficiary had already been given a generic ID (MPRID) substitute during sample selection, the MPRID was retained as a means to uniquely identify each individual.

5. Initial Frequencies

MPR computed frequencies for all fields in the original data file. These tabulations served as a reference for the file in its original form and allowed comparison to final frequencies from previous years, helping to pinpoint problem areas that needed cleaning and editing. MPR examined these frequencies and cross-tabulations, using the results to adapt and modify the cleaning and editing specifications as necessary.

6. Data Cleaning and Recoding of Variables

MPR's plan for data quality is found in the 1999 Adult Coding Scheme. It contains detailed instructions for all editing procedures used to correct data inconsistencies and errors. The Coding Scheme tables are found in Appendix D. These tables outline in detail the approach for recoding self-reported fields, doing range checks, logic checks, and skip pattern checks to insure that responses are consistent throughout the questionnaire. The Coding Scheme tables specify all possible original responses and any recoding, also indicating if backward coding or forward coding was used. Every skip pattern is assigned a note number shown in the annotated questionnaire (Appendix A). This note number defines the flag (for example, the Note 5 flag is N5) that is set to indicate the pattern of the original responses and any recoding. Thus, if the value of N5 is 2, the reader can look at line 2 in the Note 5 table for the original and recoded response values.

The SAS program implementing the coding scheme is found in Appendix H.2.

a. Check Self-Reported Fields

Several survey questions seek information that can be verified with DEERS data and/or sampling variables. Nevertheless, in recoding these self-reported fields (such as sex, active duty status, and TRICARE enrollment) we used the questionnaire responses unless they were missing; in which case, we used the DEERS data. For example, if the question on the sex of the beneficiary was not answered, the recoded variable for self-reported sex was not considered missing but was given the DEERS value for gender. If there was any disagreement between questionnaire responses and DEERS data, the questionnaire response generally took precedence.

In many tables and charts in the reports, the DEERS information was used rather than the recoded self-reported information for active duty status and TRICARE enrollment.

b. Skip Pattern Checks

At several points in the survey, the respondent should skip certain questions. If the response pattern is inconsistent with the skip pattern, each response in the series will be checked to determine which are most accurate, given the answers to other questions. Questions that are appropriately skipped were set to the SAS missing value of '.N'. Inconsistent responses, such as answering questions that should be skipped or not answering questions that should be answered, were examined for patterns that could be resolved. Frequently, responses to subsequent questions provide the information needed to infer the response to a question that was left blank. 1999 Adult Coding Scheme (see Appendix D) specifically addresses every skip pattern and shows the recoded values for variables within each pattern; we back coded and/or forward coded to ensure that all responses are consistent within a sequence.

c. Range Checks

MPR verified each response to ensure that values are within range. For example, if a response puts the day of the month at 35, we recoded the day of the month to indicate that it is "out of range." This out-of-range response code is a SAS missing value of '.O'.

d. Missing Values

DRC initially encoded any question with missing responses to a SAS missing value code of '.'. After verifying skip patterns, MPR recoded some of these responses to reflect valid skips (SAS missing value code of '.N'). The complete list of codes for types of missing values such as multiple responses, incomplete grids, and questions that should not have been answered is shown in Table 3.3.

Occasionally, missing questionnaire responses can be inferred by examining other responses. For example, if a respondent fails to answer Question 38 about his/her use of a emergency room, but goes on to reasons why he/she used an emergency room, then we assume that the answer to Question 38 should have been "yes". Using this technique, we recoded some missing questionnaire responses to legitimate responses.

e. Multiple Response Errors

If a respondent gives more than one answer to a question that should have only one answer, the response to that question was generally coded with a SAS missing value of '.A'. For certain questions, however, we used the greater or greatest value as the response. For example, if there was more than one response to the question about the highest education level obtained, we would deduce that the higher (or highest) level is the accurate response.

Using an approach similar to that used for missing values, we examined other questionnaire responses in an attempt to infer what the respondent intended for those questions with multiple

marks. For example, if there are multiple responses to Question 32 “In the last 12 months, did you call a doctor’s office or clinic *during regular office hours* to get help or advice *for yourself*?” and the response to Question 33 indicates that the respondent usually got the medical advice they needed for themselves, we assume that the response to Question 32 should have been “yes“.

f. Logic Checks

Most logic problems are due to inconsistent skip patterns, for example, when a male answers a question intended for women only. Other internal inconsistencies were resolved in the same manner as skip pattern inconsistencies — by looking at the answers to all related questions. For instance, several questions related to smoking were examined as a group to determine the most appropriate response pattern so that any inconsistent response could be reconciled to the other responses in the group.

7. Quality Assurance

MPR created an edit flag for each Coding Scheme table that indicates what, if any, edits were made in the cleaning and editing process. This logic was also used in previous years; variables such as N5 (see Appendix D) indicate exactly what pattern of the Coding Scheme was followed for a particular set of responses. These edit flags have a unique value for each set of original and recoded values, allowing us to match original values and recoded values for any particular sequence.

In order to validate the editing and cleaning process, MPR prepared cross-tabulations between the original variables and the recoded variables with the corresponding edit flag. This revealed any discrepancies that needed to be addressed. In addition, we compared unweighted frequencies of each variable with the frequencies from the original file to verify that each variable was accurately recoded. MPR reviewed these tabulations for each variable in the survey. If necessary, the earlier edit procedures were modified and the Coding Scheme program rerun. The resulting file was clean and ready for analysis.

C. RECORD SELECTION

To select final records, we first defined a code that classifies each sampled beneficiary as to his/her final response status. To determine this response status, we used postal delivery information provided by DRC for each sampled beneficiary. This information is contained in the FLAG_FIN variable which is described in Table 3.4

TABLE 3.4

FLAG_FIN VARIABLE

Value	Questionnaire Return Disposition	Reason/Explanation Given	Eligibility
1	Returned survey	Completed and returned	Eligible
2	Returned ineligible	Returned with at least one question marked and information that the beneficiary was ineligible	Ineligible
3	Returned blank	Information sent that beneficiary is temporarily ill or incapacitated	Eligible
4	Returned blank	Information sent that beneficiary is deceased	Ineligible
5	Returned blank	Information sent that beneficiary is incarcerated or permanently incapacitated	Ineligible
6	Returned blank	Information sent that beneficiary left military, or divorced after 6/1/99, or retired	Eligible
7	Returned blank	Information sent that beneficiary was not eligible on 6/1/99	Ineligible
8	Returned blank	Blank form accompanied by reason for not participating	Eligible
9	Returned blank	No reason given	----
10	No return	Temporarily ill or incapacitated. Information came in by phone	Eligible
11	No return	Active refuser. Information came in by phone	Eligible
12	No return	Deceased. Information came in by phone	Ineligible
13	No return	Incarcerated or permanently incapacitated. Information came in by phone	Ineligible
14	No return	Left military or divorced after 6/1/99, or retired. Information came in by phone	Eligible
15	No return	Not eligible on 6/1/99. Information came in by phone	Ineligible
16	No return	Other eligible. Information came in by phone	Eligible
17	No return	No reason	---
18	PND	No address remaining	---
19	PND	Address remaining at the close of field	---
20	Original Non-Locatable	No address at start of mailing	---
21	No return or returned blank	Written documentation declining participation, no reason given	Eligible
22	No return or returned blank	Hospitalized but no indication if temporary or permanent	---

Using the above variables in Table 3.4, we classified all sampled beneficiaries into four groups:

- **Group 1**: Eligible, Questionnaire Returned. Beneficiaries who were eligible for the survey and returned a questionnaire with at least one question answered (FLAG_FIN = 1)
- **Group 2:** Eligible, Questionnaire Not Returned (or returned blank). Beneficiaries who did not complete a questionnaire but who were determined to be eligible for military health care on June 1, 1999, that is, not deceased, not incarcerated, not permanently hospitalized (FLAG_FIN = 3, 6, 8, 10, 11, 14, 16, 21)
- **Group 3:** Ineligible Beneficiaries who were ineligible because of death, institutionalization, or no longer being in the MHS as of June 1, 1999 (FLAG_FIN = 2, 4, 5, 7, 12, 13, 15)
- **Group 4:** Eligibility Unknown. Beneficiaries who did not complete a questionnaire and for whom survey eligibility could not be determined (FLAG_FIN = 9, 17, 18, 19, 20, 22)

Group 1 was then divided into two subgroups according to the number of survey items completed (including legitimate skip responses):

- G1-1. Complete Questionnaire Returned

G1-2. Incomplete Questionnaire Returned

G1-1 consists of eligible respondents who answered “enough” questions to be classified as having completed the questionnaire. G1-2 consists of eligible respondents who answered only a few questions. To determine if a questionnaire is complete, 29 key questions were chosen. These key questions were adapted from the complete questionnaire rule for the CAHPS 2.0. The key questions are: 3, 4, 5, 22, 23, 24, 25, 26, 28, 30, 32, 33, 34, 35, 36, 38, 39, 40, 41, 44, 55, 62, 64, 66, 71, 77, 84, 85, 86. If fifteen or more of these key items are completed, then the questionnaire can be counted as complete.

Furthermore, we also subdivided Group 4 into the following:

- G4-1 for Locatable-blank return/no reason or no return/no reason (FLAG_FIN = 9, 17, 22)

G4-2 for Nonlocatable-postal nondeliverable/no address, postal nondeliverable/had address, or original nonlocatable (FLAG_FIN = 18, 19, 20).

With this information, we can calculate the location rate (see Section 4.A).

With a code (FNSTATUS) for the final response/eligible status, we classified all sampled beneficiaries using the following values of FNSTATUS:

- 11 for G1-1
- 12 for G1-2
- 20 for Group 2
- 30 for Group 3
- 41 for G4-1
- 42 for G4-2

There were 286 duplicate questionnaires in the data set DRC delivered. All duplicates were classified into one of the above six groups. We then retained the one questionnaire for each beneficiary that had the most "valid" information for the usual record selection process. For example, if two returned questionnaires from the same beneficiary have FNSTATUS code values of 11, 12, 20, 41, or 42, we retained the questionnaire with the smaller value. However, if one of a pair of questionnaires belongs to Group 3 (FNSTATUS = 3, i.e., ineligible), then we regarded the questionnaire as being ineligible.

Only beneficiaries with FNSTATUS = 11 were retained. All other records were dropped. We retained 84,946 eligible respondents, 41 percent of the total attempted 1999 questionnaires.

D. CONSTRUCTED VARIABLES

One of the most important aspects of database development is the formation of constructed variables and scale variables to support analysis. Constructed variables are formed when no single question in the survey defines the construct of interest. In Table 3.1 there is a list of all constructed variables for 1999 along with the page reference where complete descriptions are found. Each constructed variable is discussed in this section and the relevant piece of SAS code is shown. All SAS programs can be found in Appendix J.

1. Demographic Variables

a. Region (XREGION)

Catchment area codes (CACSMPL) are used to classify beneficiaries into specific regions. The XREGION variable partitions all catchment areas into non-overlapped regions so that we can report catchment-level estimates in the catchment reports. The regions are defined as follows:

1 = Northeast

2 = Mid-Atlantic

3 = Southeast

4 = Gulfsouth

5 = Heartland

6 = Southwest

7,8 = Central

9 = Southern California

10 = Golden Gate

11 = Northwest

12 = Hawaii

13 = Europe

14 = Western Pacific Command (Asia)

15 = TRICARE Latin America

16 = Alaska

.= Unassigned (CACSMPL = 9999)

For the purposes of our analysis, Region 7 and Region 8 were combined.

```
/* XREGION -HEALTH CARE REGIONS */

IF CACSMPL IN (0035, 0036, 0037, 0066, 0067, 0068, 0069, 0081, 0086, 0100,
              0123, 0306, 0310, 0321, 0326, 0330, 0385, 0413, 9901)
              THEN XREGION= 1;
ELSE IF CACSMPL IN (0089, 0090, 0091, 0092, 0120, 0121, 0122, 0124, 0335,
```

```
            0432, 0433, 9902)
            THEN XREGION= 2;
ELSE IF CACSMPL IN (0039, 0041, 0045, 0046, 0047, 0048, 0049, 0050, 0051,
            0101, 0103, 0104, 0105, 0337, 0356, 0422, 9903)
            THEN XREGION= 3;
ELSE IF CACSMPL IN (0001, 0002, 0003, 0004, 0038, 0042, 0043, 0073, 0074,
            0107, 0297, 7139, 9904)
            THEN XREGION= 4;
ELSE IF CACSMPL IN (0055, 0056, 0060, 0061, 0095, 9905)
            THEN XREGION= 5;
ELSE IF CACSMPL IN (0013, 0062, 0064, 0096, 0097, 0098, 0109, 0110, 0112,
            0113, 0114, 0117, 0118, 0338, 0363, 0364, 0365, 0366, 9906)
            THEN XREGION= 6;
ELSE IF CACSMPL IN (0008, 0009, 0010, 0079, 0083, 0084, 0085, 0108, 9907)
            THEN XREGION= 7;
ELSE IF CACSMPL IN (0031, 0032, 0033, 0053, 0057, 0058, 0059, 0075, 0076,
            0077, 0078, 0093, 0094, 0106, 0119, 0129, 7200, 9908)
            THEN XREGION= 8;
ELSE IF CACSMPL IN (0018, 0019, 0024, 0029, 0030, 0131, 0213, 0248, 5205,
            9909)
            THEN XREGION= 9;
ELSE IF CACSMPL IN (0014, 0015, 0028, 0235, 0250, 9910)
            THEN XREGION=10;
ELSE IF CACSMPL IN (0125, 0126, 0127, 0128, 0395, 9911)
            THEN XREGION=11;
ELSE IF CACSMPL IN (0052, 0280, 0287, 7043, 9912 )
            THEN XREGION=12;
ELSE IF CACSMPL IN (0606, 0607, 0609, 0617, 0618, 0623, 0624, 0629, 0633,
            0635, 0653, 0805, 0806, 0808, 0814, 8931, 8982, 9913)
            THEN XREGION=13;
ELSE IF CACSMPL IN (0610, 0612, 0620, 0621, 0622, 0637, 0638, 0639, 0640,
            0802, 0804, 0853, 0862, 9914)
            THEN XREGION=14;
ELSE IF CACSMPL IN (0449, 0613, 0615, 0616, 9915 )
            THEN XREGION=15;
ELSE IF CACSMPL IN (0005, 0006, 0203, 9916)
            THEN XREGION=16;
    ELSE IF CACSMPL = 9999
            THEN XREGION= .;
```

b. Continental United States (CONUS)

XREGION is used to classify beneficiaries either in the continental United States (CONUS) or overseas (OCONUS).

Assign indicator of CONUS based on XREGION. CONUS stands for Contential United States but it includes both Alaska and Hawaii.

```
IF      XREGION IN (1,2,3,4,5,6,7,8,9,10,11,12,16) THEN CONUS=1;
ELSE IF XREGION IN (13,14,15)                      THEN CONUS=0;
ELSE IF XREGION = .                                THEN CONUS=.;
```

c. Gender of Beneficiary (XSEXA)

XSEXA is constructed using self reported sex, gender identified on the DEERS database, and answers to gender specific questions.

```
/* Note 4 - gender SRSEX, SEX, H99017, H99018 -- H99021B, XSEXA */

 /* use SRSEX & responses to gender specific questions
    if there is discrepancy between SRSEX and SEX */
 /* set imputed MALE, FMALE based on gender specific questions */

 IF H99017 > 0 THEN MALE=1;     /* prostate */
 ELSE MALE = 0;
 IF H99018 > 0 OR H99019A > 0 OR H99019B > 0 OR H99019C > 0 OR
  H99020 > 0 OR H99021A > 0  OR H99021B > 0  THEN FMALE=1;
      /* mammogram/pap smear/PREGNANT*/

 ELSE FMALE = 0;

IF SRSEX = . OR SRSEX = .A THEN DO;
  IF  (SEX = 'F' AND MALE AND FMALE) THEN DO;
   N4A = 1;
   XSEXA = 2;
 END;
 ELSE IF (SEX = 'F' AND MALE=0 AND FMALE=0) THEN DO;
  N4A = 2;
  XSEXA = 2;
 END;
 ELSE IF (SEX = 'M' AND MALE AND FMALE) THEN DO;
  N4A = 3;
  XSEXA = 1;
 END;
 ELSE IF (SEX = 'M' AND MALE=0 AND FMALE=0) THEN DO;
  N4A = 4;
  XSEXA = 1;
 END;
 ELSE IF MALE AND NOT FMALE THEN DO;
  N4A = 5;
  XSEXA = 1;
 END;
 ELSE IF FMALE AND NOT MALE THEN DO;
  N4A = 6;
  XSEXA = 2;
 END;
 ELSE IF (SEX = 'Z' AND MALE AND FMALE) THEN DO;
  N4A = 7;
  XSEXA = .;
 END;
 ELSE IF (SEX = 'Z' AND MALE=0 AND FMALE=0) THEN DO;
  N4A = 8;
  XSEXA = .;
 END;
END;
ELSE IF (SRSEX = 1 ) THEN DO;
  IF MALE AND NOT FMALE THEN DO;
   N4A = 9;
   XSEXA = 1;
 END;
 ELSE IF NOT MALE AND FMALE THEN DO;
```

```
 IF SEX = 'F' THEN DO;
  N4A = 10;
  XSEXA = 2;
 END;
 ELSE DO;
  N4A = 11;
  XSEXA = 1;
 END;
END;
ELSE IF MALE AND FMALE THEN DO;
 N4A = 12;
 XSEXA = 1;
END;
ELSE IF MALE=0 AND FMALE=0 THEN DO;
 N4A = 13;
 XSEXA = 1;
END;
END;
ELSE IF (SRSEX = 2) THEN DO;
 IF NOT MALE AND FMALE THEN DO;
  N4A = 14;
  XSEXA = 2;
 END;
ELSE IF MALE AND NOT FMALE THEN DO;
 IF SEX = 'M' THEN DO;
  N4A = 15;
  XSEXA = 1;
 END;
 ELSE DO;
  N4A = 16;
  XSEXA = 2;
 END;
END;
ELSE IF MALE AND FMALE THEN DO;
 N4A = 17;
 XSEXA = 2;
END;
ELSE IF MALE=0 AND FMALE=0 THEN DO;
 N4A = 18;
 XSEXA = 2;
END;
END;
```

d. Beneficiary Group (XBNFGRP)

We redefined beneficiary groups to exclude active duty personnel and active duty family members who are age 65 or older. The variable XBNFGRP reconstructs beneficiary groups into the following values:

1 = Active Duty, under 65

2 = Family members of active duty, under 65

3 = Retirees, survivors, and family members, under 65

4 = Retirees, survivors, and family members, 65 or over

.= Unknown/other

```
/* XBNFGRP-Beneficiary Group that excludes those 65 and over-Active Duty
        and Family Members of Active Duty */
IF ZAGE  >= 65 AND BFGROUPP IN (1,2) THEN XBNFGRP = .;
ELSE XBNFGRP = BFGROUPP;
```

2. TRICARE Prime Enrollment and Insurance Coverage

a. TRICARE Prime Enrollment Status (XENRLLMT)

For reporting purposes, a person is considered enrolled in TRICARE Prime if they are under 65 and the poststratification enrollment type (ENGROUPP), based on DEERS data, indicates that they were enrolled at the time of data collection. Because it is important to view the experiences of active duty personnel separately from other enrollees, there is a separate category for active duty (under 65) — they are automatically enrolled in Prime. The four categories for TRICARE Prime enrollment are as follows:

1 = Active duty, under 65

2 = Other enrollees, under 65

3 = Not enrolled in TRICARE Prime, under 65

4 = Not enrolled in TRICARE Prime, 65 or over

5 = Enrolled in TRICARE Prime, 65 or over

. = Unknown

```
/* XENRLLMT--ENROLLMENT STATUS */
 IF 18 <= ZAGE  < 65 THEN DO;
  IF BFGROUPP = 1 THEN XENRLLMT = 1;          /*  Active duty (<65) */
  ELSE IF ENGROUPP IN ( 1, 2)THEN XENRLLMT = 2;  /*  Non-active duty enrolled (<65)*/
  ELSE IF ENGROUPP =3 THEN XENRLLMT = 3;       /*  Not Enrolled (<65)*/
 END;
 ELSE IF ZAGE  > = 65 THEN DO;
   IF ENGROUPP = 3 THEN XENRLLMT = 4;         /*  Not Enrolled (65+)*/
   IF ENGROUPP = 1 THEN XENRLLMT = 5;         /*  Enrolled (65+)    */
 END;
```

b. TRICARE Prime Enrollment Status by Primary Care Manager (XENR_PCM)

This variable, similar to the previous variable XENRLLMT, separates the 'other enrollees' category into those with a military primary care manager (PCM) and those with a civilian PCM. Active duty personnel are automatically enrolled and always have a military PCM. XENR_PCM has five possible values:

1 = Active duty, under 65, military PCM

2 = Other enrollees, under 65, military PCM

3 = Other enrollees, under 65, civilian PCM

4 = Not enrolled in TRICARE Prime, under 65

5 = Not enrolled in TRICARE Prime, 65 or over

6 = Enrolled in TRICARE Prime, 65 or over

. = Unknown

```
/* XENR_PCM--ENROLLMENT BY PCM TYPE */
IF 18 <= ZAGE  < 65 THEN DO;
 IF BFGROUPP = 1 THEN XENR_PCM = 1;       /*  Active duty (<65)       */
 ELSE IF ENGROUPP = 1 THEN XENR_PCM = 2;  /*  Enrolled (<65) - mil PCM */
 ELSE IF ENGROUPP = 2 THEN XENR_PCM = 3;  /*  Enrolled (<65) - civ PCM */
 ELSE IF ENGROUPP =3  THEN XENR_PCM = 4;  /*  Not Enrolled (<65)      */
END;
 ELSE IF ZAGE  > = 65 THEN DO;
   IF ENGROUPP = 3 THEN XENR_PCM = 5;      /*  Not Enrolled (65+)      */
   IF ENGROUPP = 1 THEN XENR_PCM = 6;      /*  Enrolled (65+)-mil PCM  */
 END;
```

c. TRICARE Prime Enrollment Status by PCM from Questionnaire Responses (XQENROLL)

The variable XQENROLL is analogous to the previous variable XENR_PCM but rather than using the DEERS information to determine enrollment, the responses to questions 3 and 5 are used to determine the status of the respondent according to the following categories:

1 = Active duty, under 65, military PCM

2 = Other enrollees, under 65, military PCM

3 = Other enrollees, under 65, civilian PCM

4- = Not enrolled in TRICARE Prime, under 65

5 = Not enrolled in TRICARE Prime, 65 or over

. = Unknown

If a respondent is unsure about their PCM, a default value comes from the poststratification variable (ENGROUPP).

```
/* XQENROLL--ENROLLMENT ACCORDING TO QUESTIONNAIRE RESPONSES AND */
/* USING DEERS SAMPLING VALUES  */
IF BFGROUPP = 1 AND 18 <= ZAGE < 65 THEN XQENROLL = 1; /* Active Duty (<65)*/

ELSE IF 18 <= ZAGE < 65 AND H99003 = 1 THEN DO;
IF H99005 = 1 THEN XQENROLL = 2;    /*  Enrolled (<65) - mil PCM */
ELSE IF H99005 = 2 THEN XQENROLL = 3;/* Enrolled (<65) - civ PCM */


ELSE IF H99005 = 3 THEN DO;
IF ENGROUPP = 1 THEN XQENROLL = 2;   /* Enrolled (<65) - Mil PCM */
ELSE IF ENGROUPP = 2 THEN XQENROLL = 3;/* Enrolled (<65) - Civ PCM */
END;
END;
ELSE IF H99003 NE 1 THEN DO;
IF 18 <= ZAGE < 65 THEN XQENROLL = 4;     /* Not enrolled (<65)   */
ELSE IF ZAGE >= 65 THEN XQENROLL = 5; /* Not enrolled (>=65) */
END;
```

d. Most–Used Health Plan (XINS_COV)

The respondent's most–used health plan comes directly from Question 2 (unless the respondent is active duty) and the respondent's age. For reporting purposes, we are only considering those persons under 65 to be enrolled in Prime. All active duty personnel are automatically enrolled in Prime. The five categories for this variable are as follows:

1 = Active duty, under 65

2 = Other TRICARE Prime enrollees, under 65

3 = TRICARE Standard/Extra (CHAMPUS)

4- = Medicare Part A and/or Part B

5 = Other civilian health insurance or civilian HMO

6 = Prime, 65 or over

. = Unknown

```
/* XINS_COV--INSURANCE COVERAGE */
 IF XENRLLMT = 1 THEN XINS_COV =1;                          /* Prime <65-Active Duty */
  ELSE IF 18 <= ZAGE  < 65 AND H99002 IN (1,2) THEN XINS_COV = 2; /* Prime <65-Non-active Duty */
  ELSE IF H99002 = 3 THEN XINS_COV = 3;                      /* Standard/Extra */
  ELSE IF H99002 = 5 THEN XINS_COV = 4;                      /* Medicare */
  ELSE IF H99002 IN (4,6,7) THEN XINS_COV = 5;               /* Other Insurance */
  ELSE IF ZAGE >= 65 THEN DO;
    IF XENRLLMT = 5 AND H99002 IN (1,2) THEN XINS_COV=6;     /* Prime, >= 65 */
    ELSE IF XENRLLMT=4 THEN DO;
     IF CACSMPL IN (0036, 0073, 0098, 0109, 0113, 0117, 0032, 0033, 0029, 0125) THEN
      XINS_COV=6;
    END;
  END;
```

e. Types of Coverage (KCIVINS, KMEDIGAP)

Two binary variables were created to indicate the types of insurance that respondents use:

- Is the respondent covered by Civilian insurance (KCIVINS)
- Is the respondent covered by Medigap (KMEDIGAP)

These variables have the following values:

1 = Yes

2 = No

.= Unknown

```
/* KCIVINS--IS BENEFICIARY COVERED BY CIVILIAN INSURANCE */
IF H99007J=1 THEN KCIVINS=1;  /* YES  */
ELSE KCIVINS=2;               /* NO   */
```

```
/* KMEDIGAP--IS BENEFICIARY COVERED BY MEDIGAP */
IF H99007G=1 THEN KMEDIGAP=1;  /*  YES  */
ELSE KMEDIGAP=2;  /*  NO  */
```

f. Out-of-Pocket Costs (KCOST_2)

A binary variable (KCOST_2) was created to indicate those respondents whose out-of-pocket costs for medical care and medical insurance was over $200.

1 = Out-of-pocket costs over $200

2 = Out-of-pocket costs not over $200

3 = Out-of-pocket costs unknown

```
/* KCOST_2--OUT OF POCKET COSTS GREATER THAN $200 */
IF H99061B > 200 THEN KCOST_2=1;    /* YES */
ELSE IF 0 <= H99061B <= 200 THEN KCOST_2=2;  /* NO */
```

3. Satisfaction Measures

a. Enrollment Intentions (KENRINTN, KDISENRL)

Active duty personnel are not asked the questions on enrollment intentions. If a non-active duty respondent is not currently enrolled in TRICARE Prime, he or she is asked about his or her intention to enroll (Question 73). Similarly, if a non-active duty respondent is enrolled in TRICARE Prime, he or she is asked about the likelihood of disenrolling (Question 72). A binary variable is created to group the responses to the enrollment questions into these categories:

1 = response of likely or very likely

2 = all other valid responses

. = missing response

```
/* KENRINTN--INTENTION TO ENROLL */
IF H99073  IN (4, 5) THEN KENRINTN = 1;                /* Yes */
ELSE IF H99073  IN (1, 2, 3, -5) THEN KENRINTN = 2;    /* No  */


/* KDISENRL--INTENTION TO DISNEROLL */
IF H99072  IN (4, 5) THEN KDISENRL = 1;                /* Yes */
ELSE IF H99072  IN (1, 2, 3, -5) THEN KDISENRL = 2;    /* No  */
```

4. Access to Care (KMILWAT1, KCIVWAT1, KMILOFFC, KCIVOFFC, KBGPRB1, KBGPRB2)

Many of the survey questions on access relate directly to a TRICARE performance standard. The questions in Section VI of the questionnaire are answered only for the respondent's most-used facility. For these questions, we constructed binary variables, separately for military and civilian facilities, indicating whether the TRICARE standard was met. Table 3.5 presents those standards that were analyzed in the reports. The new variables have the following values:

1 = Standard was met

2 = Standard was not met

= Missing information

TABLE 3.5

TRICARE STANDARDS FOR ACCESS

Access Measure	TRICARE Standard	Variable Name	Relevant Question
Wait for a Well Visit	Less than 4 weeks	KMILWATI, KCIVWATI	42
Waiting Room Wait	Within 30 minutes	KMILOFFC, KCIVOFFC	46

```
/* KMILWAT1--WAIT LESS THAN 4 WEEKS FOR WELL PATIENT VISIT AT MIL FACILITIES
KCIVWAT1--WAIT LESS THAN 4 WEEKS FOR WELL PATIENT VISIT AT CIV FACILITIES*/
IF H99037  = 1 THEN DO;                    /* Military */
IF H99042  IN (1, 2) THEN KMILWAT1 = 1;      /*  Yes */
ELSE IF H99042  IN (3,4) THEN KMILWAT1 = 2;   /*  No  */
END;
ELSE IF H99037  = 2 THEN DO;                /*  Civilian */
IF H99042  IN (1, 2) THEN KCIVWAT1 = 1;     /*  Yes */
ELSE IF H99042  IN (3,4) THEN KCIVWAT1 = 2;  /*  No  */
END;

/* KMILOFFC--OFFICE WAIT OF 30 MINUTES OR MORE AT MILITARY FACILITES
KCIVOFFC--OFFICE WAIT OF 30 MINUTES OR MORE AT CIVILIAN FACILITES */
IF H99037  = 1 THEN DO;                     /* Military */
IF H99046  IN (3,4) THEN KMILOFFC = 1;          /*  Yes */
ELSE IF H99046  IN (1,2) THEN KMILOFFC = 2;       /*  No  */
END;
ELSE IF H99037  = 2 THEN DO;                  /*  Civilian */
IF H99046  IN (3,4) THEN KCIVOFFC = 1;        /* Yes */
ELSE IF H99046  IN (1,2) THEN KCIVOFFC = 2;    /* No */
END;
```

Question 27 asks how much of a problem, if any, it was to get a referral to a specialist. The responses to this question are regrouped by a binary variable KBGPRB1. KBGPRB1 looks at these two categories:

1 = Those who reported a “big problem”

2 = Those who reported not a “big problem”

. = Missing response

```
/* KBGPRB1--BIG PROBLEM GETTING REFERRALS TO SPECIALISTS */
IF H99027  =1 THEN KBGPRB1 =1;                /* YES */
ELSE IF H99027  IN (2,3) THEN KBGPRB1 =2;          /* NO  */
```

Similarly, variable KBGPRB2 was constructed. Question 47 asks about how much of a problem, if any, it was to get the care you or a doctor believed necessary. The responses to this question are regrouped by a binary variable KBGPRB2. KBGPRB2 looks at these two categories:

1 = Those who reported a “big problem”

2 = Those who reported not a “big problem”

```
. = Missing response
/* KBGPRB2--BIG PROBLEM GETTING NECESSARY CARE */
IF H99047  =1 THEN KBGPRB2 =1;                    /* YES */
ELSE IF H99047  IN (2,3) THEN KBGPRB2 =2;         /* NO  */
```

5. Health Status (SF12PCS, SF12MCS, KMID_H, KMID_MH)

Results for health status are reported in summary measure format using the system provided in the manual "SF-12: How to Score the SF-12 Physical & Mental Health Summary Scales" (Ware, Kosinski, and Keller 1995). The Health Institute granted OASD (HA) permission to use the SF-12 Physical and Mental Health Summary Scales derived from the 36-item Health Survey 1.0[4] originally developed as part of the Medical Outcomes Study. Section VIII of the questionnaire, entitled "Your Health," contains the SF-12 questions. The first 12 questions in this section can be used to construct two health summary measures, the summary physical and mental health measures. The corresponding questions appear in Table 3.7. The last question of this section of the questionnaire seeks information on the number of days missed from work due to illness or injury, this is a stand-alone item not used in scale or summary measure construction.

In the SF-12 approach, all 12 items are used with two sets of weights, one for physical health and one for mental health.

In order to create consistent coding to reflect a higher value for better health, some responses were recoded as shown in Table 3.6:

TABLE 3.6

QUESTIONNAIRE RECODES FOR SF-12 CALCULATION

Response Option	Original Coded Value	Recoded Value
All of the time	6	1
Most of the time	5	2
A good bit of the time	4	3
Some of the time	3	4
A little of the time	2	5
None of the time	1	6
No response	.	.
Multiple response error	.A	.

The calculation of the physical health summary measure and the mental health summary measure are presented in Table 3.7. In this table, the indicator variables are binary variables set to 1 if the condition is true and to 0 if the condition is not true.

[4]The 1999 questionnaire includes the SF-12 Health Survey, item numbers 1 to 8, reproduced with permission of the Medical Outcomes Trust, copyright© 1994 The Health Institute; New England Medical Center.

TABLE 3.7

WEIGHTING COEFFICIENTS FOR CALCULATING PHYSICAL AND MENTAL HEALTH SUMMARY MEASURES

Variable	Item Response Choice(s)	H99 Value	Reverse Score	Indicator Variable	Physical Weight	Mental Health
H99078A	Moderate activities (PF02)					
	Limited a lot	3	1	PF02_1	-7.23216	3.93115
	Limited a little	2	2	PF02_2	-3.45555	1.86840
	No, not limited at all	1	3		0.00000	0.00000
H99078B	Climbing several flights of stairs (PF04)					
	Limited a lot	3	1	PF04_1	-6.24397	2.68282
	Limited a little	2	2	PF04_2	-2.73557	1.43103
	No, not limited at all	1	3		0.00000	0.00000
H99079A	Accomplish less than you would like (RP2)					
	Yes	1		RP2_1	-4.61617	1.44060
	No	2			0.00000	0.00000
H99079B	Limited in the kind of activities (RP3)					
	Yes	1		RP3_1	-5.51747	1.66968
	No	2			0.00000	0.00000
H99081	Pain interferes with normal work (BP2)					
	Extremely	5	1	BP2_1	-11.25544	1.48619
	Quite a bit	4	2	BP2_2	-8.38063	1.76691
	Moderately	3	3	BP2_3	-6.50522	1.49384
	A little bit	2	4	BP2_4	-3.80130	0.90384
	Not at all	1	5		0.00000	0.00000
H99077	In general, would you say your health is (GH1)	1		GH1_1	-8.37399	-1.71175
	Poor	2		GH1_2	-5.56461	-0.16891
	Fair	3		GH1_3	-3.02396	0.03482
	Good	4		GH1_4	-1.31872	-0.06064
	Very good	5			0.00000	**0.00000**
	Excellent					
H99082B	Have a lot of energy (VT2)					
	None of the time	1		VT2_1	-2.44706	-6.02409
	A little of the time	2		VT2_2	-2.02168	-4.88962
	Some of the time	3		VT2_3	-1.61850	-3.29805
	A good bit of the time	4		VT2_4	-1.14387	-1.65178
	Most of the time	5		VT2_5	-0.42251	-0.92057
	All of the time	6			0.00000	0.00000
H99083	Health interferes w/social activities (SF2)*					
	All of the time	6[a]	1	SF2_1	-0.33682	-6.29724
	Most of the time	5	2	SF2_2	-0.94342	-8.26066
	A good bit of the time or some of the time	4, 3	3	SF2_3	-0.18043	-5.63286
	A little of the time	2	4	SF2_4	0.11038	-3.13896
	None of the time	1	5		0.00000	0.00000

Variable	Item Response Choice(s)	H99 Value	Reverse Score	Indicator Variable	Physical Weight	Mental Health
H99080A	Accomplish less than you would like (RE2)					
	Yes	1		RE2_1	3.04365	-6.82672
	No	2			0.00000	0.00000
H99080B	Didn't do activities as carefully as usual (RE3)					
	Yes	1		RE3_1	2.32091	-5.69921
	No	2			0.00000	0.00000
H99082A	Felt calm and peaceful (MH3)					
	None of the time	1		MH3_1	3.46638	-10.19085
	A little of the time	2		MH3_2	2.90426	-7.92717
	Some of the time	3		MH3_3	2.37241	-6.31121
	A good bit of the time	4		MH3_4	1.36689	-4.09842
	Most of the time	5		MH3_5	0.66514	-1.94949
	All of the time	6			0.00000	0.00000
H99082C	Felt downhearted and blue (MH4)					
	All of the time	6	1	MH4_1	4.61446	-16.15395
	Most of the time	5	2	MH4_2	3.41593	-10.77911
	A good bit of the time	4	3	MH4_3	2.34247	-8.09914
	Some of the time	3	4	MH4_4	1.28044	-4.59055
	A little of the time	2	5	MH4_5	0.41188	-1.95934
	None of the time	1	6		0.00000	0.00000
	Constant				56.57706	60.75781

[a]These values represent annotated questionnaire values rather than recoded values as shown in the 1997 Technical Manual.

* The response choice "A good bit of the time" was combined with "some of the time" in order to accurately use the SF12 Physical and Mental Health Summary Measured Weights.

The complete SAS code to develop the values SF12PCS and SF12MCS appears in Appendix J-6. The development of the indicator variables can be deduced from Table 3.7; the final equations to create SF12PCS and SF12MCS are shown below:

```
/*************************************************************************
WEIGHTING AND AGGREGATION OF INDICATOR VARIABLES USING PHYSICAL AND MENTAL
REGRESSION    WEIGHTS.AWPCS12    &    RAWMCS12    ARE    TEMPORARY    VARIABLES
*************************************************************************/
          RAWPCS12 = (-7.23216*PF02_1) + (-3.45555*PF02_2) +
              (-6.24397*PF04_1) + (-2.7357*PF04_2) + (-4.61617*RP2_1) +
              (-5.51747*RP3_1) + (-11.25544*BP2_1) + (-8.38063*BP2_2) +
              (-6.50522*BP2_3) + (-3.80130*BP2_4) + (-8.37399*GH1_1) +
              (-5.56461*GH1_2) + (-3.02396*GH1_3) + (-1.31872*GH1_4) +
              (-2.44706*VT2_1) + (-2.02168*VT2_2) + (-1.6185*VT2_3)  +
              (-1.14387*VT2_4) + (-0.42251*VT2_5) + (-0.33682*SF2_1) +
              (-0.94342*SF2_2) + (-0.18043*SF2_3) + (0.11038*SF2_4)  +
              (3.04365*RE2_1) + (2.32091*RE3_1)  + (3.46638*MH3_1) +
              (2.90426*MH3_2) + (2.37241*MH3_3)  + (1.36689*MH3_4) +
              (0.66514*MH3_5) + (4.61446*MH4_1)  + (3.41593*MH4_2) +
              (2.34247*MH4_3) + (1.28044*MH4_4)  + (0.41188*MH4_5);
          RAWMCS12 = (3.93115*PF02_1) + (1.8684*PF02_2) +
```

```
        (2.68282*PF04_1) + (1.43103*PF04_2) + (1.4406*RP2_1)  +
        (1.66968*RP3_1)  + (1.48619*BP2_1)  +  (1.76691*BP2_2)  +
        (1.49384*BP2_3)  + (0.90384*BP2_4)  +  (-1.71175*GH1_1) +
        (-0.16891*GH1_2) + (0.03482*GH1_3)  +  (-0.06064*GH1_4) +
        (-6.02409*VT2_1) + (-4.88962*VT2_2) +  (-3.29805*VT2_3) +
        (-1.65178*VT2_4) + (-0.92057*VT2_5) +  (-6.29724*SF2_1) +
        (-8.26066*SF2_2) + (-5.63286*SF2_3) +  (-3.13896*SF2_4) +
        (-6.82672*RE2_1) + (-5.69921*RE3_1) +  (-10.19085*MH3_1) +
        (-7.92717*MH3_2) + (-6.31121*MH3_3) +  (-4.09842*MH3_4) +
        (-1.94949*MH3_5) + (-16.15395*MH4_1) +  (-10.77911*MH4_2) +
        (-8.09914*MH4_3) + (-4.59055*MH4_4) + (-1.95934*MH4_5);


/*****************************************************************
            NORM-BASED STANDARDIZATION OF SCALE SCORES
*****************************************************************/
  SF12PCS = RAWPCS12 + 56.57706;
  SF12MCS = RAWMCS12 + 60.75781;
```

Many of the reports show the percentage of respondents whose health status measures fall below the national median after adjustments for age (KMID_H, KMID_MH). These are binary variables where a value of 1 indicates that the condition is true and a value of 2 indicates that the condition is false.

```
****BELOW MEDIAN PHYSICAL HEALTH****;
IF SRAGE < 18 OR SF12PCS = . THEN KMID_H = .;
ELSE IF 18 <= SRAGE <= 34 AND SF12PCS < 55.18 THEN KMID_H = 1;
ELSE IF 35 <= SRAGE <= 44 AND SF12PCS < 54.30 THEN KMID_H = 1;
ELSE IF 45 <= SRAGE <= 54 AND SF12PCS < 52.76 THEN KMID_H = 1;
ELSE IF 55 <= SRAGE <= 64 AND SF12PCS < 50.22 THEN KMID_H = 1;
ELSE IF 65 <= SRAGE <= 74 AND SF12PCS < 46.36 THEN KMID_H = 1;
ELSE IF SRAGE >= 75 AND SF12PCS < 38.68 THEN KMID_H = 1;
ELSE KMID_H = 2;


****BELOW MEDIAN MENTAL HEALTH****;
IF SRAGE < 18 OR SF12MCS = . THEN KMID_MH = .;
ELSE IF 18 <= SRAGE <= 34 AND SF12MCS < 51.81 THEN KMID_MH = 1;
ELSE IF 35 <= SRAGE <= 44 AND SF12MCS < 52.24 THEN KMID_MH = 1;
ELSE IF 45 <= SRAGE <= 54 AND SF12MCS < 53.30 THEN KMID_MH = 1;
ELSE IF 55 <= SRAGE <= 64 AND SF12MCS < 53.14 THEN KMID_MH = 1;
ELSE IF 65 <= SRAGE <= 74 AND SF12MCS < 55.31 THEN KMID_MH = 1;
ELSE IF SRAGE >= 75 AND SF12MCS < 53.53 THEN KMID_MH = 1;
ELSE KMID_MH = 2;
```

6. Preventive Care (HP_PRNTL, HP_MAMOG, HP_PAP, HP_BP, HP_FLU, HP_PROS, HP_GP, HP_CHOL, HP_SMOKE, HP_BRST)

As in some of the access analyses, preventive care analyses incorporated either a TRICARE standard or a federal Healthy People 2000 objective. We constructed new binary variables from the responses to indicate whether the respondent received the preventive care service within the recommended time period. See Table 3.8 for the list of the variables developed for analysis of preventive care; these variables will be compared to the TRICARE standard or Healthy People 2000 Goal. The new variables have the following values:

1 = Received service within the recommended time period

2 = Did not received service within the recommended time period

.= Missing information

```
/* HP_PRNTL--IF PREGNANT LAST YEAR, RECEIVED PRENATAL CARE IN 1ST TRIMESTER
*/
IF H99020  IN (1,2) THEN DO;                          /*   Pregnant in last 12 months   */
IF H99021B = 4 THEN HP_PRNTL = 1;                     /*   Yes   */
ELSE IF (H99021A = 1 AND H99021B = 1) THEN HP_PRNTL = .;    /* <3 months pregnant now */
ELSE IF H99021B IN (1,2,3) THEN HP_PRNTL = 2;         /*   No */
END;

/* HP_MAMOG--FOR WOMEN AGE 50 AND OVER, HAD MAMMOGRAM W/IN PAST 2 YEARS
*/
IF XSEXA = 2 AND ZAGE  >= 50 THEN DO;
IF H99019B IN (5, 4) THEN HP_MAMOG = 1;          /* Yes */
ELSE IF H99019B IN (1, 2, 3) THEN HP_MAMOG = 2;    /* No */
END;

/* HP_PAP--FOR ALL WOMEN, HAD PAP SMEAR IN LAST 3 YEARS */
IF XSEXA = 2 THEN DO;
IF H99018  IN (4, 5) THEN HP_PAP = 1;          /* Yes */
ELSE IF H99018  IN (1, 2, 3) THEN HP_PAP = 2;    /* No  */
END;

/* HP_BP--HAD BLOOD PRESSURE SCREENING IN LAST 2 YEARS AND KNOW RESULT */
IF H99009A IN (2,3) AND H99009B IN (1, 2) THEN HP_BP = 1; /* Yes */
ELSE IF H99009A = 1 THEN HP_BP = 2;                /*    No */
ELSE IF H99009A < 0 OR H99009B < 0 THEN HP_BP = .;     /* Unknown */
ELSE HP_BP = 2;        /*    No */

/* HP_FLU--FOR PERSON AGE 65 OR OVER, HAD FLU SHOT IN LAST 12 MONTHS */
IF ZAGE  >= 65 THEN DO;
IF H99011 = 4 THEN HP_FLU = 1;                 /*   Yes */
ELSE IF H99011 IN (1, 2, 3) THEN HP_FLU = 2;       /*   No  */
END;

/* HP_PROS--FOR MEN AGE 50 AND OVER, HAD PROSTRATE EXAM W/IN PAST 12
MONTHS */
IF XSEXA = 1 AND ZAGE  >= 50 THEN DO;
IF H99017  = 5 THEN HP_PROS = 1;                /*   Yes */
ELSE IF H99017  IN (1, 2, 3, 4) THEN HP_PROS = 2;   /*   No   */
END;


/* HP_GP--EXCEPT WHEN SICK OR PREGNANT, GENERAL PHYSICAL EXAM W/IN PAST 12
MONTHS */
IF H99008 = 5 THEN HP_GP = 1;                /*   Yes    */
ELSE IF H99008 IN (1, 2, 3, 4) THEN HP_GP = 2;  /*   No     */
```

```
/* HP_CHOL--HAD CHOLESTEROL SCREENING IN PAST 5 YEARS */
IF H99010 IN (3, 4, 5) THEN HP_CHOL = 1;        /*   Yes   */
ELSE IF H99010 IN (1, 2) THEN HP_CHOL = 2;      /*   No    */

/* HP_SMOKE--ADVISED TO QUIT SMOKING IN PAST 12 MONTHS */
IF H99015 IN (2, 3, 4, 5) THEN HP_SMOKE = 1;    /*  Yes   */
ELSE IF H99015 = 1 THEN HP_SMOKE = 1;           /*  No    */

/* HP_BRST--BREAST EXAM IN PAST 12 MONTHS */
IF XSEXA=2 AND ZAGE >= 40 THEN DO;
IF H99019C = 5 THEN HP_BRST = 1;                /*  Yes   */
ELSE IF H99019C IN (1, 2, 3, 4) THEN HP_BRST = 2;  /*  No    */
END;
```

TABLE 3.8

PREVENTIVE CARE STANDARDS

Preventive Care Delivered	Question Number	Variable Name	Received Service In Recommended Time Period (Numerator)	Population Involved (Denominator)	Standard
General Physical	8	HP_GP	Number with care in the past 12 months	Adults	None
Blood Pressure Check	9a & 9b	HP_BP	Number with care in the past 24 months and know the results	Adults	90% within past 2 years
Cholesterol Screening	10	HP_CHOL	Number with care in the past 60 months	Adults	75% in the past 60 months
Flu Shot	11	HP_FLU	Number with care in the past 12 months	Adults age 65 and older	60% in past year, age 65 and over
Pap Smear	18	HP_PAP	Number with care in the past 36 months	Adult females	85% in the past 36 months
Mammography	19b	HP_MAMOG	Number with care in the past 24 months	Females age 50 and over	60% in the past 24 months
Breast Exam	19c	HP_BRST	Number with care in the past 12 months	Females age 40 and over	60% in the past 12 months
Prostate Exam	17	HP_PROS	Number with care in the past two years	Males age 40 and over	All males age 50 and over an annual exam and PSA blood test
Smoking Counseling	15	HP_SMOKE	Number with care in the past 12 months	All current adult smokers and those who quit smoking within the past year	75% in past year
Prenatal Care	21b	HP_PRNTL	Number with care in the first trimester	Currently pregnant adult females and all adult females who were pregnant in the past 12 months, excluding those less than 3 months pregnant who haven't received care	90% had care in first trimester

7. Utilization

a. Outpatient Utilization (KMILOP99, KCIVOP99)

Question 40 contains the total outpatient visits to military facilities. This is renamed to KMILOP99 and adjusted to reflect zero visits for those with no care or no care at military facilities. KCIVOP99, the total outpatient visits to civilian facilities, is question 41, after similar adjustments for no care.

```
/* KMILOP99--OUTPATIENT VISITS TO MILITARY FACILITY
KCIVOP99--OUTPATIENT VISITS TO CIVILIAN FACILITY */
IF H99037  = 3 THEN KMILOP99=1;
ELSE KMILOP99 = H99040 ;
IF H99037  = 3 THEN KCIVOP99=1;
ELSE KCIVOP99 = H99041 ;
```

b. Use of Military Pharmacies to Fill Civilian Prescriptions (KPRSCPTN)

KPRSCPTN is a binary variable created to indicate if a respondent had seven or more prescriptions that were written by a civilian provider but were filled by a military pharmacy.

```
/* KPRSCPTN--7 OR MORE CIVILIAN PRESCRIPTIONS FILLED BY MILITARY PHARMACY */
IF H99056 IN (3,4) THEN KPRSCPTN = 1; /* YES */
ELSE IF H99056 IN (1,2) THEN KPRSCPTN =2; /* NO */
```

E. WEIGHTING PROCEDURES

Estimates based on the 1999 HCSDB must account for the survey's complex sample design and for the biasing effects that nonresponse can have. As a part of sample selection, MPR constructed sampling weights (BWT99) that reflect the differential selection probabilities used to sample beneficiaries across strata. Nonresponse can also lead to distortions of the respondent sample with respect to the total population of DoD health care beneficiaries. Adjustments were made to these sampling weights, BWT99, to compensate for such distortions, using a weighting class method. These adjusted weights were also adjusted through the poststratification procedure to form the analysis weights, which we included in the final deliverable database. We also generated replicate weights for the final database so that users have the option of obtaining variance estimates with a replication method as well as the Taylor series method. This section presents these weighting procedures for the 1999 Adult HCSDB.

1. Constructing the Sampling Weight

The sampling weight was constructed on the basis of the sample design. In the 1999 Adult HCSDB, stratified sampling was used to select the samples that would receive the questionnaire. Sampling for Form A administration was independently executed within strata defined by combinations of the three domains: enrollment status groups; beneficiary groups; and geographic areas.

The sample was selected with differential probabilities of selection across strata. Sample sizes were driven by predetermined precision requirements. For further details of the 1999 adult sample design, see Jang et al. (1999). Our first step in weighting was to construct sampling weights that reflect these unequal sampling rates. These sampling weights can be viewed as the number of population elements that each sampled beneficiary represents. The sampling weight was defined as the inverse of the beneficiary's selection probability or:

(1) $$W_s(h,i) = \frac{N(h)}{n(h)}$$

where:

$W_s(h,i)$ is the sampling weight for the *i*-th sampled beneficiary within the *h*-th stratum,

$N(h)$ is the total number of beneficiaries in the *h*-th stratum, and
$n(h)$ is the number of sampled beneficiaries from stratum *h*.

The sum of the sampling weights over selections from the *h*-th stratum equals the total population size of the *h*-th stratum or $N(h)$.

2. Adjustment for Total Nonresponse

Survey estimates obtained from respondent data only can be biased with respect to describing characteristics of the total population (Lessler and Kalsbeek 1992). To reduce this bias, we developed procedures to deal with the problems caused by nonresponse. Two types of nonresponse were associated with the 1999 Adult HCSDB:

- Unit or total nonresponse occurs when a sampled beneficiary did not respond to the survey questionnaire (e.g., refusals, no questionnaire returned, blank questionnaire returned, bad address).

Item nonresponse occurs when a question that should have been answered is not answered (e.g., refusal to answer, no response).

With high item response rates observed in previous surveys, statistical imputation was not used to compensate for item nonresponse in the 1999 Adult HCSDB. To account for total nonresponse, we implemented a weighting class adjustment followed by a poststratification adjustment.

3. Weighting Class Adjustment

Weighting class adjustments were made by partitioning the sample into groups, called *weighting classes*, and then adjusting the weights of respondents within each class so that they sum to the weight total for nonrespondents and respondents from that class. Implicit in the weighting class adjustment is the assumption that — had the nonrespondents responded — their responses would have been distributed in the same way as the responses of the other respondents in their class.

The 1999 Adult HCSDB weighting classes were defined on the basis of the stratification variables: TRICARE Prime enrollment status, beneficiary group, and geographic area. To avoid excessive variance inflation, we required that each weighting class have at least 20 eligible respondents, and that the adjustment factor not exceed 4.

Nonresponse adjustment factors for the 1999 Adult HCSDB were calculated in two steps. First, we adjusted the sampling weights to account for sampled beneficiaries for whom eligibility status could not be determined. Sampled beneficiaries were then grouped as follows according to their response status d:

d=1 Eligible — completed questionnaire returned (FNSTATUS = 11)

d=2 Eligible — incomplete or no questionnaire returned (FNSTATUS = 12 or 20)

d=3 Ineligible — deceased incarcerated or permanently incapacitated beneficiary (FNSTATUS = 30)

d=4 Eligibility unknown — no questionnaire or eligibility data (FNSTATUS = 41 or 42)

Within weighting class *c*, the weights of the *d*=4 nonrespondents with unknown eligibility were redistributed to the cases for which eligibility was known (*d*=1,2,3), using an adjustment factor $A_{wc1}(c,d)$ that was defined to be zero for *d*=4 and defined as:

(2)

$$A_{wc1}(c,d) = \frac{\sum_{i \in S(c)} W_s(c,i)}{\sum_{i \in S(c)} I_1(i) W_s(c,i) + \sum_{i \in S(c)} I_2(i) W_s(c,i) + \sum_{i \in S(c)} I_3 W_s(c,i)} \quad \text{for } d = 1, 2, 3$$

where:

$A_{wc1}(c,d)$ is the eligibility-status adjustment factor for weighting class *c* and response status code *d*,

$I_d(i)$ is the indicator function that has a value of 1 if sampled unit *i* has a response status code of *d* and 0 otherwise,

$S(c)$ is the set of sample members belonging to weighting class *c*, and

$W_s(c,i)$ is the sampling weight (BWT99) for the *i*-th sample beneficiary from weighting class *c* before adjustment.

The adjustment $A_{wc1}(c,d)$ was then applied to the sampling weights to obtain the eligibility-status adjusted weight. Beneficiaries in weighting class *c* with response status code of *d* were assigned the eligibility-status adjusted weight:

(3) $$W_{wc1}(c,d,i) = A_{wc1}(c,d)\, W_s(c,i)$$

Note that since *d*=4 cases have adjustment factors of zero, they also have adjusted weights of zero.

The next step in weighting was to adjust for the loss of completed questionnaires from beneficiaries known to be eligible. For this adjustment, the weighting class *c* from the previous step was again partitioned into groups according to the beneficiary's response status code *d*. Within weighting class *c*, the weights of the *d*=2 nonresponding eligibles were redistributed to the responding eligibles *d*=1, using an adjustment factor $A_{wc2}(c,d)$ that was defined to be zero for *d*=2,4. For Group 1 (*d*=1), the questionnaire-completion adjustment or $A_{wc2}(c,1)$ factor for class *c* was computed as:

(4) $$A_{wc2}(c,1) = \frac{\sum_{i \in S(c)} I_1(i) W_{wc1}(c,i) + \sum_{i \in S(c)} I_2(i) W_{wc1}(c,i)}{\sum_{i \in S(c)} I_1(i) W_{wc1}(c,i)}$$

By definition, all *d*=3 ineligible beneficiaries "respond," so the *d*=3 adjustment factor is 1, or $A_{wc2}(c,3)=1$. The questionnaire-completion adjusted weight was calculated as the product of the questionnaire-completion adjustment $A_{wc2}(c,d)$ and the previous eligibility-status adjusted weight $W_{wc1}(c,d,i)$, or:

(5) $$W_{wc2}(c,d,i) = A_2(c,d)\, W_{wc1}(c,d,i)$$

As a result of this step, all nonrespondents (d=2,4) had questionnaire-completion adjusted weights of zero, while the weight for ineligible cases (d=3) remained unchanged, or $W_{wc2}(c,3,i)=W_{wc1}(c,3,i)$.

4. Poststratification

Since the data on TRICARE Prime enrollment status used for selecting the 1999 HCSDB sample was imperfect, poststratification adjustments were used for the 1999 HCSDB to improve those data. Poststratification adjustments forced the adjusted weight totals to the DEERS population totals for the specified population groups that formed the *poststrata*. We used DEERS data as of December 1, 1999 as poststratification values for certain variables. Like stratum variables, poststratum variables are also a combination of three key domain variables: enrollment group, beneficiary group, and geographic area. Construction of beneficiary groups and geogrphic areas is the same as in sampling strata variables except for the reference date. However, enrollment group assignment was corrected with the following specification.

Beneficiary's Prime enrollment status was coded as one of these three cases: (1) "MIL" -- enrolled as a military PCM; (2) "CIV" -- enrolled as a civilian PCM; and (3) " " -- not enrolled. The specifications for the enrollment specification are:

- If Alternate Care Value (ACV) is one of the these three values: A = Active Duty; E = Prime; U = USTF, the corresponding beneficiary is regarded as Prime enrollee;
- Among Prime satisfying the above criterion, Civilian PCM should be assigned to the beneficiaries with Enrollment MTF values such as the ranges of 7901-7916, 8001-8036, and 6901-6912;

All other enrollees with other Enrollment MTFs including missing values are regarded as being enrolled with a military PCM

After creating the cross-classification of the three poststrata variables, enrollment group, beneficiary group and geographic area, an additional usual poststratification adjustment was implemented. To illustrate the use of poststratification, let g index poststrata, where g = 1, 2, ..., G. The poststratification adjustment factor for the g-th poststrata was defined as:

(6)
$$A_{ps}(g) = \frac{N(g)}{\sum_{h,i \in S(g)} W_{wc2}(h,i)}$$

where:

$N(g)$ is the total number of beneficiaries in the DEERS frame associated with the g-th post-stratum, and

$S(g)$ is the set of sample records that are found in the g-th poststratum.

The poststratified adjusted weight for the i-th sample record from the h-th design stratum and the g-th poststratum was then calculated as:

(7)
$$W_{ps}(g,h,i) = A_{ps}(g)\, W_{wc2}(h,i)$$

When summed over members of poststratum g, the poststratified weights now total $N(g)$. This poststratified weight is the final analysis weight used for all reporting and analysis.

5. Calculation of Jackknife Replicates

We constructed the 40 jackknife replicates as follows. First, the entire file of sampled beneficiaries was sorted according to stratification variables. Next, 40 mutually exclusive and exhaustive systematic sub-samples of the full sample was identified in the sorted file. A jackknife replicate was then obtained by dropping one subsample from the full sample. By dropping each subsample in turn, the same number of different jackknife replicates as subsamples was defined. The entire weighting process as applied to the full sample was then applied separately to each of the jackknife replicates to produce a set of replicate weights for each record. A series of jackknife replicate weights (WRWT01-WRWT40) was then attached to each beneficiary record in the final database. Given jackknife replicate weights, WesVarPC® (Brick et al. 1996) or in-house programs can be used to construct jackknife replication variance estimates.

Chapter
4

Analysis

This chapter explains how the HCSDB variables were processed during the analysis phase of the project. It covers the procedure for calculating response rates, development of the dependent and independent variables for the analysis and the method for estimating the variance of the statistics. The National Executive Summary Report is described briefly along with an outline of the steps involved to create charts for the reports.

A. RESPONSE RATES

In this section, we present the procedures for response rate calculation along with a brief analysis of response rates for domains of interest. Response rates for the 1999 Adult HCSDB were calculated in the same way as they were calculated in 1998. The procedure is based on the guidelines established by the Council of American Survey Research Organization (CASRO 1982) in defining a response rate.

1. Definition of Response Rates

In calculating response rates and related measures, we considered two different rates: *unweighted* and *weighted*. The unweighted version of the response rate represents the counted proportion of respondents among all sampled units, and the weighted version indicates the estimated proportion of respondents among all population units. When sampling rates across all strata are equal, these two approaches give the same result. However, the 1999 HCSDB used different sampling rates across strata. So, it is useful to show both “unweighted” and “weighted” response rates. We calculated these two response rates in the same way. As presented in Chapter 3.C, all sampled beneficiaries were completely classified into these four main (six detailed) groups: Group 1 (G1-1 and G1-2), Group 2, Group 3, and Group 4 (G4-1 and G4-2):

- Group 1 (G1-1): eligible and complete questionnaire returned;
- Group 1 (G1-2): eligible and incomplete questionnaire returned;
- Group 2: eligible and questionnaire not returned;
- Group 3: ineligible
- Group 4 (G4-1): eligibility unknown and locatable; and

Group 4 (G4-2): eligibility unknown and unlocatable.

The unweighted counts reflect the number of sampled cases (n_i for Group i, where i =1,2,3,4), and the weighted counts reflect the estimated population size[1] ($\hat{N}_i$ for Group i, where i =1,2,3,4) for the four main response categories.

These weighted and unweighted counts were also calculated for the subgroups G1-1, G1-2, G4-1, and G4-2, where we denote the unweighted counts by $n_{1,1}$, $n_{1,2}$, $n_{4,1}$, and $n_{4,2}$, and the weighted counts by $\hat{N}_{1,1}, \hat{N}_{1,2}, \hat{N}_{4,1}$, and $\hat{N}_{4,2}$. With these values, we calculated response rates as follows. Each sampled beneficiary was classified as eligible (member of Group 1 or 2), ineligible (member of Group 3), or of unknown eligibility (member of Group 4). Then, we calculated the unweighted *eligibility determination rate EDR* as:

(1) $$EDR = \frac{n_1 + n_2 + n_3}{n}$$

where n is the total sample size or $n = n_1 + n_2 + n_3 + n_4$. Similarly, we calculated the weighted eligibility determination rate EDR_w as:

(2) $$EDR_w = \frac{\hat{N}_1 + \hat{N}_2 + \hat{N}_3}{\hat{N}}$$

where $\hat{N}$ is the estimated total population size or $\hat{N} = \hat{N}_1 + \hat{N}_2 + \hat{N}_3 + \hat{N}_4$. *EDR* measures the proportion of sampled beneficiaries whose eligibility status was determined, while EDR_w measures the equivalent population proportion for DEERS.

Given eligibility determination rates, we calculated the *questionnaire return rate* or *QRR* (unweighted and weighted) as follows:

(3)

$$QRR = \frac{n_1}{n_1 + n_2} \quad \text{and} \quad QRR_w = \frac{\hat{N}_1}{\hat{N}_1 + \hat{N}_2}.$$

For the purpose of calculating *QRR*, the sampled beneficiary need only have answered one item on the questionnaire to be classified as having "returned the questionnaire."

Using Group 1 as the definition of "respondent" would result in an underestimation of the true extent of nonresponse and interject many missing values into item-specific analyses. For this reason, we applied a different definition of "respondent" to calculate final response rates and weighting adjustments. (See Section III.C for the definition of a completed questionnaire.)

We applied this definition to the Group 1 returned questionnaires, partitioning them into G1-1 and G1-2, where G1-1 comprised the returned questionnaires with enough items answered to be considered "complete." The counts $n_{1,1}$, $\hat{N}_{1,1}$, $n_{1,2}$, and $\hat{N}_{1,2}$ denote the unweighted and weighted sample sizes corresponding to G1-1 and G1-2, respectively. Using this notation, we defined the unweighted and weighted questionnaire completion rates (*QCR* and QCR_w) as follows:

(4) $$QCR = \frac{n_{1,1}}{n_1} \quad \text{and} \quad QCR_w = \frac{\hat{N}_{1,1}}{\hat{N}_1}.$$

[1]The weighted sum of sampled units can be regarded as an estimated population size. The base weight (BWT99) was used in calculating weighted counts, where BWT99 is the inverse of selection probability.

The final response rate for the 1999 HCSDB was obtained as the product of the eligibility determination rate, the questionnaire return rate, and the questionnaire completion rate, or:

(5)

$$FRR = EDR \times QRR \times QCR \qquad \text{and} \qquad FRR_w = EDR_w \times QRR_w \times QCR_w .$$

The final response rates (*FRR* and FRR_w) consider only the G1-1 cases as respondents (i.e., those who answered enough questions to have returned what was considered a completed questionnaire).

We also calculated two measures used in the previous surveys: the location rate and the completion rate. To calculate the location rate, we first estimated the number of Group 4 "located" beneficiaries who were expected to be eligible for the survey:

(6)

$$l = \left(\frac{n_1 + n_2}{n_1 + n_2 + n_3} \right) n_{4,1} \qquad \text{and} \qquad l_w = \left(\frac{\hat{N}_1 + \hat{N}_2}{\hat{N}_1 + \hat{N}_2 + \hat{N}_3} \right) \hat{N}_{4,1}$$

where l and l_w are unweighted and weighted estimates of the number of "located" beneficiaries among Group 4. Then, the unweighted and weighted "location rates" are defined by:

(7)

$$LR = \frac{n_1 + n_2 + l}{n_1 + n_2 + n_4 \left(\frac{n_1 + n_2}{n_1 + n_2 + n_3} \right)} \qquad \text{and} \qquad LR_w = \frac{\hat{N}_1 + \hat{N}_2 + l}{\hat{N}_1 + \hat{N}_2 + \hat{N}_4 \left(\frac{\hat{N}_1 + \hat{N}_2}{\hat{N}_1 + \hat{N}_2 + \hat{N}_3} \right)}.$$

And the corresponding unweighted and weighted "completion rates" are defined by:

(8)

$$CR = \frac{n_{1,1}}{n_1 + n_2 + l} \qquad \text{and} \qquad CR_w = \frac{\hat{N}_{1,1}}{\hat{N}_1 + \hat{N}_2 + l_w}.$$

The final response rates in Equation (5) can also be obtained by multiplying the location rate in Equation (7) by the completion rate in Equation (8).

In the definitions in Equations (2) through (8), the subscript "*w*" indicates that all calculations involve weighted counts. The method that we used to calculate response rates is consistent with the CASRO guidelines.

2. Reporting

We examined response rates to identify patterns across different domains or characteristics. While analysts prefer weighted rates that reflect the estimated proportion of respondents among all population beneficiaries, operational staff are often interested in getting unweighted measures. All tables include unweighted and weighted values under columns headed "Unweighted" and "Weighted", respectively. In the following, we focus on discussing unweighted response rates for domains of interest.

Table 4.1 includes response rates for the 1999 Adult HCSDB as a whole, by beneficiary groups, and by enrollment status.

- Overall: The overall unweighted response rate for the 1999 Adult HCSDB was about 42 percent (which is found in Table 4.1 in the row of "Overall" under the column of "FRR" in "Unweighted"). This rate is substantially lower than the 51 percent rate achieved in the 1997 survey, but somewhat higher than the 35 percent achieved in 1998.
- Beneficiary group: All response rates according to beneficiary groups show similar patterns as the 1998 survey, i.e., active duty beneficiaries had the lowest response rates and beneficiaries 65 years and older had the highest rate.*

Enrollment status: Response rate for enrollees with a military PCM is 37 percent which is less than those for enrollees with a civilian PCM (48 percent) and nonenrollees (48 percent).

TABLE 4.1

RESPONSE RATES OVERALL, BY ENROLLMENT GROUP, AND BY BENEFICIARY GROUP

	UNWEIGHTED			WEIGHTED		
	FLR[1] (%)	FCR[2] (%)	FRR[3] (%)	FLR (%)	FCR (%)	FRR (%)
Overall	97.0	43.2	41.9	96.8	50.4	48.7
Enrollment Group						
Military PCM	97.4	38.0	37.0	96.7	37.4	36.1
Civilian PCM	98.8	48.3	47.7	98.9	52.1	51.5
Not enrolled	96.2	49.8	47.9	96.6	57.4	55.5
Beneficiary Group						
Active duty, under 65	94.9	28.0	26.6	93.1	26.0	24.2
Family members of active duty, under 65	98.2	32.6	32.0	98.2	33.0	32.4
Retirees, survivors, and family members, under 65	98.3	56.0	55.1	98.1	56.5	55.4
Retirees, survivors, and family members, 65 and over	97.6	76.5	74.6	97.3	74.9	72.8

[1] Final Location Rate
[2] Final Completion Rate
[3] Final Response Rate

* However, response patterns vary considerably across beneficiary groups. The relatively low level of response for active duty persons and their family members could be due to frequent relocations and our inability to receive new addresses in a timely manner.

For domains of special interest, Appendix G contains tables showing six key response rate measures: the final location rate (FLR), the final completion rate (FCR), the final response rate (FRR), and weighted versions of these three rates. We summarize results about response rates for selected domains as follows:

- ***Regions:*** Response rates across regions range from 27 percent for Region 14 (Western Pacific) to 48 percent for Region II (Northwest) (Table G.1).
- ***Catchment areas:*** Response rates across catchment areas range from 24 percent for catchment area 808, Aviano Army Base in Europe to 62 percent for catchment area 36, Dover Air Force Base in Region 1. (Table G.2).
- ***Enrollment sampling group by beneficiary group:*** Response rates range from 25 percent of active duty not enrolled to 52 percent for retirees, survivors, and family members, 65 or over, who are also not enrolled (Table G.3).
- ***Beneficiary group by pay grade/military personnel category (MPC) of sponsor (enlisted, warrant officer, officer):*** There is a discrepancy of response rates among PG/MPC groups. The lowest rate is 18 percent for active duty at level 4, the largest is 82 percent for retirees, survivors and family members over 65 (Table G.4).
- ***Beneficiary group by service affiliation (Army, Air Force, Navy):*** Among service affiliations, the smallest response rate comes from active duty Marine Corps with 18 percent and the largest from retirees over 65 from the Air Force with 76 percent (Table G.5).
- ***Beneficiary group by race/ethnicity (white, black, Hispanic, American Indian/Alaskan, Asian Pacific Islander, other):*** White beneficiaries showed higher response rates than other race/ethnicity groups across all beneficiary groups. The smallest response rate comes from Black active duty beneficiaries with 20 percent and the largest from White retirees over 65 with 76 percent (Tables G.6).

Sex by beneficiary group: Note that females show substantially higher response rates that males among active duty persons and their family members; 29 to 26 percent for active duty and 33 to 21 percent for family members of active duty. The opposite pattern emerges for retirees, survivors and family members 65 and older. (Table G.7).

B. VARIANCE ESTIMATION

To calculate the standard errors (the squared roots of variances) of estimates for the 1999 HCSDB analyses, we used the Taylor series linearization method via SUDAAN™ (Shah et al. 1996). For analysts who prefer a replication method, 40 replicate weights for jackknife replication are provided in the public use file. Here we describe variance estimation methods for the Taylor series linearization method and the jackknife replication method.

1. Taylor Series Linearization

MPR uses Taylor series linearization to produce standard errors for the estimates from the 1999 HCSDB. For most sample designs, including the 1999 HCSDB, design-based variance estimates for linear estimators of totals and means can be obtained with explicit formulas. Estimators for nonlinear parameters such as ratios do not have exact expressions for the variance. The Taylor series linearization method approximates the variance of a nonlinear estimator with the variances of the linear terms from the Taylor series expansion for the estimator (Woodruff 1971). To calculate variance estimates based on the Taylor series linearization method, given HCSDB's stratified sampling design, we need to identify stratum as well as the final analysis weight for each data record. We included these variables on the final database. For variance estimation, we use the general purpose statistical software package SUDAAN to produce Taylor series variance estimates. SUDAAN is the most widely used of the publicly available software packages based on the Taylor series linearization method. In SUDAAN, the user specifies the sampling design and

includes variables recording stratum and the analysis weight for each record. Unlike WesVarPC, there is no restriction to the number of strata in SUDAAN, so stratification effects can be incorporated in calculating standard errors.

Some of the reported estimates are composite scale scores that are linear functions of individual estimates. The sampling variance for these scale estimates can be directly obtained from the usual design-based variance estimation formula by incorporating the covariance terms among individual items within the scale.

$$\text{Let } \bar{y} = \frac{\sum_{h=1}^{L}\sum_{i=1}^{n_h} W_{hi} Y_{hi}}{\sum_{h}\sum_{i} W_{hi}}$$

denote an estimator of a composite scale where individual composite measure for beneficiary (*h*, *i*) consists of *r* items is thus denoted as:

$$Y_{hi} = \sum_{j=1}^{r} X_{hi,j} / r \quad .$$

Then, a customary variance estimator of $\bar{y}$ is the sum of the item variances and covariances among item estimates:

$$v(\bar{y}) = \frac{1}{r^2}\left\{\sum_{j=1}^{r} \text{var}(\bar{x}_j) + \sum_{j \neq j'} \text{cov}(\bar{x}_j, \bar{x}_{j'})\right\} \quad ,$$

All of the variance components can be obtained from the usual survey specific software such as SUDAAN and WesVarPC, which are described above.

2. Jackknife Replication

Jackknife replicate weights can be used to calculate the standard errors of estimates. An estimate of a characteristic of interest is calculated (with the same formula as the full sample estimate) using each set of replicate weights; these replicate estimates are used to derive the variance of the full sample statistic.

a. Calculation of Jackknife Replicates

A series of jackknife replicate weights are calculated and attached to each beneficiary record in the database. In jackknife replication, a prescribed number of replicates are generated by deleting selected cases from the full sample. Given jackknife replicate weights, WesVarPC® (Brick et al. 1996) can be used to produce variance estimates. WesVarPC allows jackknife variance estimation for two primary sampling units per stratum up to 100 strata, or up to 256 replicates without stratification. However, the 1999 HCSDB for adults involves 687 strata. To use WesVarPC, we must modify the actual design to create fewer strata. The two options for doing this are to (1) form fewer than 256 replicates by ignoring stratification or (2) form replicates by collapsing strata to fewer than 100 and by assigning each unit to one of two pseudo primary sampling units (PSUs). For either option, the entire weighting process as described in the previous sections must be applied for each jackknife replicate.

We use option 1 to construct the jackknife replicates as follows. First, the entire file of sampled beneficiaries is sorted in sample selection order in which stratification variables are only used in the sorting process. Next, 40 mutually exclusive and exhaustive systematic subsamples of the full sample are identified in the sorted file. A jackknife replicate is then obtained by dropping one subsample from the full sample. As each subsample is dropped in turn, the same number of different jackknife replicates as subsamples is defined. The entire weighting process as applied to the full sample is then applied separately to each of the jackknife replicates to produce a set of replicate weights for each record. Then, the series of jackknife replicate weights (WRWT01 – WRWT40) is attached to the final data in order to construct jackknife replication variance estimates.

b. Software for Jackknife Replication

The jackknife variance of the full sample statistic of interest is estimated from the variability among the replicated estimates. When the replicate weights are produced according to the above procedure, jackknife replicate standard errors can be produced using custom written software or publicly available statistical software. For instance, WesVarPC is a popular software package that calculates standard errors based on replication methods. It produces standard errors for functions of survey estimates such as differences and ratios as well as simple estimates such as mean, proportion, and totals. Additional details about the jackknife replication approach are given in Wolter (1985). Like other replication methods, the jackknife variance estimation can be easily implemented for any form of estimate without further algebraic work.

C. SIGNIFICANCE TESTS

In certain charts in the adult report cards and the National Executive Summary Report (NESR) statistical testing is done to show which columns of the chart (values of the independent variable) are statistically different from all CONUS regions as a whole. Positional arrows show if a region is statistically better than the CONUS regions (an arrow pointing up) or statistically worse than the CONUS regions (an arrow pointing down); if there is no arrow, there is no statistical difference.

The null hypothesis for this significance test is that the mean for the column is essentially equal with the CONUS mean, and the alternative is that the mean for the column is different from the CONUS mean. That is, we are testing:

$$H_0: m_1 = m_2 \quad \text{vs.} \quad H_a: m_1 \neq m_2$$

For instance, μ_1 might represent the characteristic of interest for the active duty group while μ_2 might represent the same characteristic for all CONUS regions.

With large sample sizes, the estimator $\overline{y_1} - \overline{y_2}$ is approximately distributed as a normal distribution with mean zero and variance $s^2_{\overline{y}_1 - \overline{y}_2}$ under the null hypothesis. In testing the hypothesis, a test Statistic T is thus calculated as:

$$T = \frac{\overline{y_1} - \overline{y_2}}{\hat{s}_{\overline{y}_1 - \overline{y}_2}}.$$

With $\alpha = 0.05$, the null hypothesis should be rejected if $|T| > 1.96$. The denominator of T, the standard error of $\overline{y_1} - \overline{y_2}$, can be calculated as the square root of the variance estimator $\hat{s}^2_{\overline{y}_1 - \overline{y}_2}$:

$$\hat{s}^2_{\bar{y}_1-\bar{y}_2} = \mathrm{var}(\bar{y}_1) + \mathrm{var}(\bar{y}_2) - 2\,\mathrm{cov}(\bar{y}_1, \bar{y}_2).$$

If $\bar{y}_1$ and $\bar{y}_2$ are independent, then the covariance term equals zero and thus the variance estimator can be easily obtained as the sum of two individual variance estimators. However, there are some cases in which the condition of independence does not hold. For example, Active Duty MTF group is not independent with the CONUS regions because these two domains share Active duty group within the CONUS regions. So the covariance term should be incorporated in calculating the variance estimator of the estimator of the difference. With suitable algebra and program modification, these covariance terms were calculated for all such cases. All detailed programs are included in Appendix J-12.

D. DEMOGRAPHIC ADJUSTMENTS

All scores in the TRICARE Consumer Reports are adjusted for patient characteristics affecting their scores. Scores can be adjusted for a wide range of socioeconomic and demographic variables.

The purpose of risk-adjustment is to make comparisons of outcomes, either internally or to external benchmarks, that control for characteristics beyond the health care provider's control. Based on previous work with satisfaction scales derived from CAHPS, it appears that satisfaction increases with age and decreases with poor health across social classes and insurance types. Besides controlling for these factors, the methodology used:

- Permits risk adjusted comparisons among regions and catchment areas within and across beneficiary and enrollment groups
- Permits testing the hypothesis that the difference in risk-adjusted scores between a region or catchment area and a benchmark is due to chance
- Is appropriate for CAHPS composites and global satisfaction ratings.

The methodology used is an adaptation of that found in CAHPS 2.0 Survey and Reporting Kit (DHHS, 1999)

The model used for this adjustment is:

$$Y_{ijkl} = b_{1l}A_{1l} + b_{2l}A_{2l} + \ldots + b_{7l}A_{7l} + b_{8l}P_l + b_{9l}M_l + e_{ijkl},$$

where the subscript *l* refers to a beneficiary group, Y_{ijkl} is a dependent variable, β_{ql}'s are parameters to be estimated, A_{ql}'s are age dummy variables (A_{ql} = 1 if the beneficiary is in age group *q*, and 0 otherwise; A_l = age 18-24, A_2 = age 24-34, A_3 = age 35-44, A_4 = age 45-54, A_5 = age 55-64, A_6 = age 65-74, and A_7 = age 75 and older), P_l is the physical composite score from the SF-12, and M_l is the mental composite score from the SF-12. The subscripts *i*, *j*, and *k* refer to the region, MTF, and beneficiary, respectively.

Given 15 regions and *J*+1 catchment areas, the specifications that we use are:

$$e_{ijkl} = d_{0l} + d_{l1}R_{l1} + d_{2l}R_{l2} + \ldots + d_{15l}R_{15l} + w_{ijk},$$

where R_i 's are regional dummy variables (R_{il} = 1 if the beneficiary is in region *i* and beneficiary group *l*, and 0 otherwise), and

$$e_{ijkl} = g_{0l} + g_lH_{1l} + g_{2l}H_{2l} + \ldots + g_{Jl}H_{Jl} + w_{ijkl},$$

where H_{ij} 's are catchment area dummy variables (H_{ijl} = 1 if the beneficiary is in catchment area *j* and beneficiary group *l*, and 0 otherwise). The first specification is used when catchment area values are not reported, and the second when catchment areas are reported.

The methods for calculating demographically adjusted values and testing hypotheses of differences in demographically adjusted scores among providers vary with the way e_{ijkl} is defined. For specification 1, the adjusted mean of the dependent variable *Y* for region *i* can be obtained as:

$$\overline{y_i} = \hat{d}_0 + \hat{d}_i + \hat{b}_1\hat{A}_1 + \hat{b}_2\hat{A}_2 + \ldots + \hat{b}_7\hat{A}_7 + \hat{b}_8\hat{P} + \hat{b}_9\hat{M} \ ,$$

where $\hat{b}_i$'s are estimated model parameters, $\hat{A}_i$'s are weighted proportions of age group *i* among the total U.S. population, and $\hat{P}$ and $\hat{M}$ are weighted MHS means of the variables *P* and *M,* respectively. For beneficiary group *l*, the adjusted regional value is:

$$\overline{y_{il}} = \hat{d}_{0l} + \hat{d}_{il} + \hat{b}_{1l}\hat{A}_{1l} + \hat{b}_{1l}\hat{A}_{2l} + \ldots + \hat{b}_{7l}\hat{A}_{7l} + \hat{b}_{8l}\hat{P}_l + \hat{b}_{9l}\hat{M}_l \ ,$$

where $\hat{A}_{ql}$'s are weighted proportions of age group *q* for beneficiary group *l* in the MHS. The value for catchment area *J* can be calculated as $\overline{y}_{il} + \overline{w}_{ijkl}$, where $\overline{w}_{ijkl}$ is the mean residual for catchment area *J* and beneficiary group(s) *l*.

For specification 2, an adjusted catchment area value can be calculated as:

$$\overline{y_{ij}} = \hat{g}_0 + \hat{g}_j + \hat{b}_1\hat{A}_1 + \hat{b}_2\hat{A}_2 + \ldots + \hat{b}_7\hat{A}_7 + \hat{b}_8\hat{P} + \hat{b}_9\hat{M} \ ,$$

while the regional value can be calculated as:

$$\overline{y_i} = \hat{g}_0 + \overline{\hat{g}} + \hat{b}_1\hat{A}_1 + \hat{b}_2\hat{A}_2 + \ldots + \hat{b}_7\hat{A}_7 + \hat{b}_8\hat{P} + \hat{b}_9\hat{M} \ ,$$

where $\overline{\hat{g}}$ is the weighted mean for all catchment areas in Region i.

Standard errors then can be estimated as the standard error of residuals for catchment areas or regions using SUDAAN. These standard errors can be used in hypothesis tests comparing adjusted values to other adjusted values or to external benchmarks. Composite values are calculated as averages of regional or catchment area adjusted values for questions making up the composites, in which each question is equally weighted.

E. DEPENDENT AND INDEPENDENT VARIABLES

Dependent, or outcome, variables represent the research questions the survey is designed to answer. For example, beneficiary satisfaction and access are dependent variables in this analysis. The research questions are listed in Chapter I. Generally, dependent variables form the rows of the tables and the vertical axis of the charts.

Independent, or explanatory, variables do not directly represent research questions, but they may help to explain the differences in one or more of the outcome variables. They may also be correlated with one or more dependent variables. For example, a beneficiary's satisfaction with health care may be correlated with their age and/or TRICARE Prime enrollment status. Each table is designed to help determine whether a particular dependent variable is correlated with a particular

independent variable. Independent variables form the columns of the tables and the horizontal axis of the charts.

In analyzing the relationship between dependent and independent variables, MPR produced charts and tables that are found in the reports described below. Beginning with the HCSDB in a SAS format, MPR programmers developed SAS procedures such as PROC FREQ and PROC MEANS and SAS-callable SUDAAN procedures such as PROC DESCRIPT and PROC CROSSTAB to generate the relevant statistics (e.g., per cents, means, and standard errors). These statistical values were moved directly from SAS programs to Excel tables using a dynamic data exchange to populate the cells of the tables. Graphical displays were generated from table values wherever feasible.

F. REPORTS

This section lists the two types of reports produced and states the main purpose of each report: 1999 TRICARE Consumer Reports and National Executive Summary Report. For further statistical and web specifications for the consumer reports, please refer to Appendix J. The last part of this section explains the procedure for report production.

1. 1999 TRICARE Consumer Reports

a. Purpose

The purpose of the report card is to provide Lead Agents and MTF commanders with a comprehensive description of TRICARE beneficiaries' satisfaction with care, access to care, and use of preventive care, in comparison with other regions and catchment areas, and with relevant civilian benchmarks. The report card provides an easy-to-understand snapshot of various aspects of the quality of care in the MHS. Users will be able to easily "drill down" to follow the performance of providers over time and among different enrollment and beneficiary groups.

b. Report Card Production

1) Programming Specifications

Data for the report consist of summary records indexed by region, catchment area, enrollment group, and beneficiary category. Benchmark records with no geographic reference are also included in the file. A summary record contains: mean composite scores, p-values for tests of difference from the relevant benchmark, a categorical variable describing the existence and direction of significant differences. Other records contain past years of the composite, p-values for a test of the existence of a trend, a categorical variable describing the existence and direction of a significant trend, and mean scores or individual elements of the composite. Benchmark records contain national mean or median values, where available, for a comparable population. Programs used to produce the consumer reports are in Appendix J.

2) Web Specifications

The ASCII file serves as the basis for the 1999 TRICARE Consumer Reports. For the 1999 HCSDB, a single file contains all catchment area, regional and CONUS values. Specifications for the web design of the consumer reports in Appendix I.

2. National Executive Summary Report

The purpose of the National Executive Summary Report is to provide OASD(HA), in general, and TMA, in particular, with a comprehensive national summary of the HCSDB findings. The National

Executive Summary Report bar charts reflect survey data from *all* respondents in the domestic MHS.

In Appendix E, there is a complete list of the graphs in the National Executive Summary Report along with the relevant independent and dependent variables and variables defining the population.

3. Procedures for Report Production

There are multiple steps required to design tables and charts and then to populate them with data from the HCSDB. These steps are described below.

1) Creating the table shells, chart shells, and page templates

The first step in creating the charts/tables for the reports is creating a chart/table shell in Excel. Charts in Excel are created using the Chart Wizard:

- First select the type of chart to show. For most charts in the reports, these are clustered column charts.
- Next select the data range, which is the group of cells that contain the data to go into the charts. These data are grouped into series, and the series labels are used in the legend, while group labels are used as x-axis labels.
- Select Chart Options. This is where the axis titles are entered and where formatting of the axes, gridlines, legend, and data labels occurs.
- Finally, place the chart on the correct worksheet.

Once all of the charts for the reports are created, they should be formatted with the same fonts and colors and set up to be the same size when printed. The size of the charts is established by using Page Setup from the File menu and changing the margins as follows:

- Top margin is 0.975
- Right margin is 1.0
- Bottom margin is 4.8
- Left margin is 0.9.

In addition, each chart is set to print landscape.

To create tables in Excel, start with a blank worksheet and type the title across the top row. The headings for each column in the table go into the second row, and row labels go into the first column of the worksheet. Once all of the labels are in place, format the table in this manner:

- Align the labels
- Add borders and shading
- Cells that contain the data should be centered and formatted to show one decimal place
- Cells that contain the standard errors should be formatted to appear in parentheses

Once all of the charts and tables are created in Excel, three macros written in Visual Basic for Applications (VBA) within Excel will automate tasks required for each region. One macro requires the user to input the region number or name, then changes all region references in chart labels, table titles, table labels, and any other references within the spreadsheet to the new region number or name. Two other macros copy the worksheets containing tables to new worksheets, in order to make printing of the tables easier and quicker.

2) Creating Page Templates

The next step in producing the report is to develop a template page in Word for each chart. In 1999 these Word templates were created using the same format as the 1998 report. The top of the page of each template shows the chart title and associated questions. In the middle of each page is a space for the chart. The bottom left side of the page shows the population, sample size, and descriptions of the chart axes, and the bottom right side of the page includes the description of what the chart shows and the findings section.

3) Populating the Tables

MPR wrote the programs to populate the charts in SAS, using SAS-callable SUDAAN. There are two different types of programs used to create the charts. One type of program creates the charts that show the average ratings of a variable, and the second type of program is used to create the charts that show percentages. The programs for average ratings use the SAS procedure PROC DESCRIPT, and the VAR, TABLES, SUBGROUP, SUBPOPN, and OUTPUT statements are changed for each chart. The programs that calculate percentages use the PROC CROSSTAB procedure, and the TABLES, SUBGROUP, SUBPOPN, and OUTPUT statements in that procedure are changed for each chart. A sample program appears in Appendix K. There is a separate program for each chart, and for each chapter of the report there is an overall program that runs all of the individual chart programs in that chapter. The chapter program contains macro variables for region, name of the data file, location of program files, and name of the Excel file containing the charts. This facilitates making changes when the programs are run for each region, as all changes are made just once in the overall chapter program.

Each chart program also contains a DDE link to run the SAS output for each chart into the Excel file, onto the worksheet that contains the standard error table associated with the chart. The data is set up to run into cells on the worksheet that are below the table that is already there. The DDE link contains row and column references for where to start running the data into Excel and where to end. The data series for each chart and the standard error tables then reference these cells. A sample cell reference looks like:

- ='Table1'!A1

This example takes the value from the first column (A) and first row (1) of the worksheet labeled Table1.

There are separate programs that calculate significance so that arrows can be added to the charts to indicate whether a finding is significantly higher or lower than the CONUS MHS average or to an external benchmark. Output of these programs is a value of 0, 1, or 2 for each bar in the chart;

- 0 denotes no significant difference
- 1 denotes a value significantly higher than CONUS MHS

2 denotes a value significantly lower then CONUS MHS

These values are moved into the appropriate Excel worksheet using a DDE link within the significance test program. A macro written in VBA adds the appropriate arrows to the charts by identifying the value for each bar in the chart and drawing the appropriate arrow to the left of the data label above the bar.

4) Finalizing Pages

Finally, each completed chart is moved from Excel into its corresponding Word template. To ensure uniformity of the size of each chart within the Word template, all charts are formatted in Excel to be the same size when printed. This is done manually, and each step listed below must be done for each chart:

- The first step in moving the charts from Excel to Word is to hold down the Shift key while selecting the Edit menu on the Excel toolbar and then selecting the option to Copy Picture. This brings up a menu with options for copying both the size and appearance of the picture as it is shown on the screen or when printed. For both options, the charts are copied with the option of "as shown when printed".
- The Word template is then brought up on the screen, and the chart is pasted into the Word document by selecting either Ctrl-V or Paste on the Edit menu.
- The chart can then be moved to the correct place in the template, and a border is placed around the chart by selecting the Format menu on the Word tool bar and clicking on Picture. When this brings up another menu, select the Colors and Lines tab, change the line color to black, and then click the OK button on the menu to draw a solid border around the chart.

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